# DOCUMENT RESUME

ED 302 523 SP 030 786

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|---|---|
| AUTHOR | Midtlyng, Joanna; Nelson, C. Van Cleave |
| TITLE | National Survey of Water Exercise Participants. D.C., July 5-8, 1988). Papers by U.S.S.R. |
| INSTITUTION | American Council of Learned Societies, New York, N.Y.; International Research and Exchange Board, New York, N.Y. |
| PUB DATE | 88 |
| NOTE | 108p.; Paper presented at the Annual Meeting of the American Alliance for Health, Physical Education, Recreation and Dance (Boston, MA, April, 1989). |
| PUB TYPE | Speeches/Conference Papers (150) -- Reports - Research/Technical (143) |
| EDRS PRICE | MF01/PC05 Plus Postage. |
| DESCRIPTORS | *Exercise; National Surveys; Older Adults; Participant Satisfaction; *Physical Therapy; *Stress Management; *Swimming |
| IDENTIFIERS | *Water Exercise |

ABSTRACT

This survey generated a profile of a typical water exercise participant. Data include: (1) subject's medical clearance for water exercise, swimming ability, physical and related problems, reasons for participation and perceived psycho-physical benefits of water exercise; (2) techniques of monitoring water exercise intensity: kinds of flotation devices and supplies used; and (3) participation patterns in about 18 different leisure, fitness and sport activities. The stimulus for in-water exercising among this survey population (n=1,180) was "keeping fit" through all-round body conditioning, which often was accompanied by an increased sense of wellness, relaxation and social interaction. Analysis of the data suggest that different benefits are derived from water exercise for different age groups. Further, the data suggest that water exercise may well be the most important physical activity for older age groups. Recommendations for further study include investigation of water exercise programs for older populations and physical/mental rehabilitation of individuals. (Author/JD)

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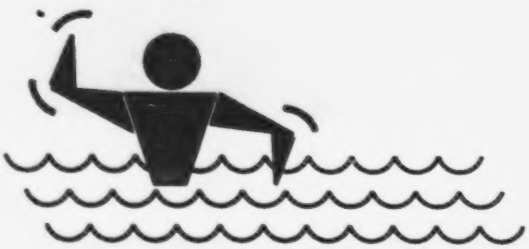

# National Survey of Water Exercise Participants

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# ACKNOWLEDGEMENTS

**Special Thanks to...**
*participating water exercise teachers*
*throughout the United States.*
For your professional support of this research
by distributing survey booklets
to water exercise respondents.

**Special Thanks to...**
*water exercise participants*
*throughout the United States.*
For giving generously of your time
by completing and returning the survey booklets
and post cards to the researchers.

**Special Thanks to...**
*Aquatic Exercise Association,*
*Port Washington, Wisconsin,*
*and*
*Y.M.C.A. of the U.S.A., Chicago, Illinois*
For professional cooperation and courtesies
extended to the researchers.

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# TABLE OF CONTENTS

Description | Page

*Acknowledgements* *i*
*Table of Contents* *ii*
*List of Tables* *iv*
*Abstract* *v*

**Chapter I. INTRODUCTION** **1**
    Statement of the Problem 1
    Purpose of the Study 2
    Need for the Study 2
    Delimitations 2
    Limitations 3
    Basic Assumptions 3
    Hypotheses 3
    Definition of Terms 3

**Chapter II. REVIEW OF RELATED LITERATURE.** **5**

**Chapter III. METHODS AND PROCEDURES** **7**

**Chapter IV. ANALYSIS AND INTERPRETATION OF THE DATA** **11**
*Section I - Descriptive Data*
        Demographic Data for Water Exercise Teachers 11
        Demographic Data for Water Exercise Participants 12
    Data for Years, Frequency and Duration of Participation 13
        Years of Participation 13
        Frequency of Participation 14
        Duration of the Water Exercise Workout 15
    Data for Respondents' Swimming Ability, Pool Used, Time of Day, and Flotation Devices or Other Supplies Used 15
        Swimming Ability of Respondents 15
        Pool Used to Water Exercise 16
        Time of Day for Water Exercise 17
        Flotation Devices or Other Supplies Used 18
    Water Exercise Instructional Patterns and Teaching Procedures 18
        Water Exercise Instructional Patterns 18
    Data for Locations of the Warm-up & Main Exercise Workout 19
        Recovery Techniques Between Vigorous Exercise 20
        Auditory Input Via Taped or Recorded Music 20
    Data for Measuring Exercise Intensity, Pulse Rate Frequency and Ability of Respondents to Calculate Target Heart Rate 21
        Measuring Exercise Intensity 21
        Pulse Rate Frequency 22
        Calculating Target Heart Rate 22

*Description* *Page*

Data for Medical Clearance for Water Exercise, Physical Conditions or Problems, and Difficulties Experienced by Respondents 22
Medical Clearance 22
Physical Conditions or Problems 23
Difficulty with Water Exercise 24
Data for Major Reasons for Water Exercising and Physical Fitness Elements Emphasized and Perceived Improved 24
Major Reasons for Water Exercising 24
Physical Fitness Element(s) Emphasized 25
Physical Fitness Element(s) Perceived Improved 25
Data for General Reasons for Water Exercise and Perceived Improvement of Selected Factors Through Water Exercise 26
Data for the Profile of A Typical Water Exercise Workout 28
Analysis and Interpretation 30
Data for the Profile of Other Leisure Fitness and Sport Activities. 31

*Section II. Comparisons Between Age Categories and Selected Factors*
Comparison of Age Categories with Water Exercise Benefits 35

**V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS** **39**
Conclusions 39
Recommendations 40

***BIBLIOGRAPHY*** ***43***

***APPENDICES*** ***49***
*Appendix A: Letter of Invitation to Water Exercise Teachers; Water Exercise Teacher Questionnaire; Instruction Sheet for Random Selection of Subjects; The Survey Instrument; and Post Card Enclosure* *49*
*Appendix B: N.A.C.A.E. Position Statement on Aquatic Exercise; and Proposed Standards for Aquatic Exercise Programs* *65*
*Appendix C: National News Releases in Selected Professional Journals, Newsletters and Trade Magazines* *67*
*Appendix D: External Letters of Support.* *73*
*Appendix E: Letters from the Director of Research, YMCA OF USA, to YMCA Executive Directors and Aquatic Directors* *81*
*Appendix F: Demographic Data for Water Exercise Teachers*
*Appendix G : Write-in Statements by Respondents for Questions Designating "Other, specify"* *85*
*Appendix H: Comments Respondents Wrote About Water Exercise* *89*
*Appendix I: The Researchers* *105*

# LIST OF TABLES

TABLE DESCRIPTION PAGE
1. Active Teachers of Water Exercise by Representative Group 11
2. Years of Participation 13
3. Frequency of Participation Weekly 14
4. Duration of Each Water Exercise Workout 15
5. Swimming Ability of Respondents 16
6. Pool Used to Water Exercise 17
7. Time of day for Water Exercise 17
8. Flotation Devices and Other Supplies Used 18
9. Water Exercise Instructional Patterns 19

10. Location of the Warm-up 19
11. Location of the Main Water Exercise Workout 20
12. Measures of Exercise Intensity in Water Exercise 21
13. Frequency of Taking Pulse Rate in a Single Water Exercise Workout 22
14. Physical Conditions or Problems of Respondents 22
15. Major Reasons for Participation 25
16. Physical Fitness Element(s) Emphasized and Perceived Improved Through Water Exercise by Respondents 25
17. General Reasons of Respondents for Water Exercising 26
18. General Factors Perceived Improved Through Water Exercise 27
19. Profile of Typical Water Exercise Workout. 29

20. Profile of Leisure Fitness and Sport Activities 32
21. Other Leisure Fitness and Sport Activities of Participants, Reported by Frequency of Weekly Participation 34
22. Comparison Between Age and Perceived Health Benefits 35
23. Comparison Between Age and Major Benefits 35
24. Comparison Between Age and Health Related Factors 36
25. Comparison Between Age and Fitness Factors 36
26. Comparison of Leisure Fitness and Sport Activities With Number and Percent Participating 37
27. Comparison of Activities With Age Categories 38

# ABSTRACT

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| **TableAuthor** | **Midtlyng, Joanna and Nelson, C. Van Cleave** |
| **Title** | **National Survey of Water Exercise Participants** |
| **Pub. Date** | **(88)** |
| **Note** | **112 pp.** |

Reported benefits of in-water exercise for the adult participant have included improved physical fitness, stress reduction and weight control. Little or no information has been available in the past about the demographics of water exercise participants, or patterns of participation in water exercise.

This survey generated profiles of a typical water exercise participant and workout within this sample. Data also included: (1) subject's medical clearance for water exercise, swimming ability, physical and related problems, reasons for participation and perceived psycho-physical benefits of water exercise; (2) techniques of monitoring water exercise intensity, kinds of flotation devices and supplies used; and (3) participation patterns in about 18 different leisure, fitness and sport activities.

The stimulus for in-water exercise among this survey population (n=1180) was "keeping fit" through all-round body conditioning, which often was accompanied by an increased sense of wellness, relaxation and social interaction. Analysis of the data suggest that different benefits are derived from water exercise for different age groups. Further, the data suggest that water exercise may well be the most important physical activity for older age groups. Recommendations for further study include investigation of water exercise programs for older populations and physical/mental rehabilitation of individuals.

# CHAPTER I

## INTRODUCTION

"Water exercise is making a name for itself in fitness circles. Its versatility has researchers scrambling to study its effectiveness."[1] The young, the old, the overweight, the overly slender, and the disabled are discovering that they can exercise in water at a pace and level of difficulty suited to their individual needs and abilities. Maintenance or improvement of physical fitness elements through water exercise often contributes to a heightened sense of wellness among participants.

The natural resistance of water and support of the body afforded by water are elements unique to water exercise. The participant can control the speed of movement of the body and body parts in water, from slow to relatively fast, and the body surfaces presented to the water, whether broad or narrow, to minimize or maximize water resistance. Achieved goals reported by participants have included increased muscular endurance, toning and firming major muscle groups and reduction of body girth measurements.

Body movement in water is not dissimilar from land. Water exercises, such as water walking or jogging, are performed in a upright position in shallow water. In water, walking and jogging become low impact activities because the water serves as a cushion slowing the downward movement of the body and body parts in water to reduce the impact of landing. In a standing position, either stationary or moving, the participant can use the known patterns of pulling, pushing and swinging of the arms, or bending, straightening and kicking patterns of the legs through water. In water, arm and leg exercises appear especially effective because water offers more resistance to these body movements than air. The use of water resistence to exercise appears to offer a maximum pay-off to the individual who exercises effectively and consistently, and is willing to expend reasonable physical energy.

Swimming ability is not requisite to water exercise. The non-swimmer may exercise at the pool wall and in open, shallow water with or without flotation devices to support the body.

The lifting effect of water on the body, combined with support afforded by flotation devices, facilitates exercises for abdominal muscles and other body parts and with an ease that often is not achieved by some individuals through land exercises. The camaraderie of other participants and the cool refreshing effect of water add to the joy of in-water exercising.

Water exercise is attractive to the general public because it affords physical exercise that is relatively inexpensive and an environment that is relatively nonstressful, both physically and psychologically. The individual with a physical disability; the arthritic whose goals include increased range of joint motion; the individual seeking physical or mental rehabilitation; and men and women of all ages, have discovered that the water medium is a great equalizer .

### Statement of the Problem

This investigation was designed to gather: (1) information on similarities and differences between various demographic groups and populations on attitudes and participation patterns in water exercise and related activities; (2) data for statistical analysis of the quality and quantity of water exercise; and (3) data on participation in about 18 other fitness and sport activities.

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[1] *Koszuta, Laurie Einstein, "Water Exercise Causes Ripples," The Physician and Sportsmedicine, 14:14,163, October 1986.*

## Purpose of Study

The major goals of this study were to gather: (1) demographic data of participants to include age, sex, income; residence by district and state; employment, marital and educational status; and ethnic group or groups with which subjects were self-identified; (2) data about a typical water exercise workout; techniques of monitoring water exercise intensity; pools used; kinds of flotation devices and supplies used; taped and recorded music used; and whether the water exercise was formally or informally instructed; (3) data about the subject's medical clearance for water exercise, swimming ability, physical and related problems of participants, reasons for participation, frequency of participation, and average number of participation days per week; and (4) data about other leisure time fitness and sports activities to investigate frequency of participation, and average number of participation days by week to cover about 18 different activities. The activities surveyed were: aerobic land exercise, archery, basketball or similar team sport, bowling or golf, boxing or wrestling, cross country skiing, cycling (bicycle riding), dancing, horseshoe pitching, judo, karate, land exercise walking or jogging, land exercise with equipment, racquet ball or similar racquet sport, sailing or canoeing, SCUBA diving, swimming and table tennis.

## Need for the Study

Reported benefits of in-water exercise for the adult participant have included improved physical fitness,[2] physical rehabilitation[3] and reduction of compression forces acting on the body tissue in the water medium. Concomitant outcomes reported have included stress reduction, weight control and slowing down the aging process[4,5,6] Little or no information has been available in the past about the demographics of water exercise participants, or typical water exercise workouts, or the benefits or problems of participants in water exercise, or the psycho-physical benefits of water exercise.

National and international leaders in aquatics and fitness related organizations, and administrators and educators at Ball State University (BSU), with commitment to safety of participants in water activities, have endorsed this research project for reasons including the need for information about water exercise participants, practices and procedures of water exercise teachers, and development of guidelines for programs of water exercise.

The need for information about water exercise participants, workouts and related factors, was demonstrated by the request of over seventy water exercise teachers, who wrote or telephoned the researcher to request inclusion in this study. Vital information, such as the reported difference between target heart rates in water exercise and land exercise, and other concerns, were expressed interests of these individuals. Data about water exercise participants, workouts and programs are requisite to study and development of standards for water exercise programs and teachers.

## Delimitations

1. Water exercise teachers who were members of the American Exercise Association (AEA), and YMCA Aquatic Directors (YMCA), were assigned numbers and selected for participation in this survey by two tables of 1000 numbers in random order.

2. Water exercise teachers who wrote or telephoned the researcher to request inclusion in this study were invited to be

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[2] *YMCA of the USA, Physical Fitness Through Water Exercise. Human Kinetics Publishers, Champaign, Il., 1982, p. 5.*

[3] *Ibid.*

[4] *Ibid.*

[5] *Krasevec, Joseph A. and Grimes, Diana C., HydroRobics. Leisure Press, Champaign, Il., 1985, pp. 150-151.*

[6] *Ibid., p. 191.*

survey booklet distributors, hereafter called volunteer water exercise teachers (VWET).

3. Water exercise teachers selected by this random process, and VWET, received a cover letter of invitation from the principal researcher for research involvement. A one page "Water Exercise Teacher Questionnaire," which included a question to indicate acceptance or rejection of the invitation for survey participation and a letter from one or two endorsees of the research study were enclosed. The researcher's letter of invitation and the Water Exercise Teacher Questionnaire are shown in Appendix A.

Y.M.C.A. Executive Directors and Aquatic Directors also received letters, dated December 11, l987, from Dr. Myrtis Meyer, Director of Research for the YMCA of the USA, to introduce the study and encourage their support of the research. These letters are shown in Appendix F.

4. Water exercise teachers who returned the "Water Exercise Questionnaire" and who responded affirmatively to the invitation for survey booklet distribution received a maximum of 10 survey booklets for distribution to water exercise participants, together with an instruction sheet with printed directions for random selection of participants. The "instruction sheet," is shown in Appendix A.

5. Water exercise participants, hereafter called "respondents", who were selected by a random process, received survey booklets from the survey distributor, together with a post card enclosure and pre-stamped return envelope.The survey booklet and post card enclosure are presented in Appendix A.

6. Water exercise respondents completed and mailed the survey booklet in individual stamped envelopes to the researchers.

7. Water exercise respondents, who were guaranteed anonymity, were requested to complete and return the post card to the researcher in separate mailings to indicate completion of the survey booklet; willingness to participate in follow-up study; and whether they wished a complete or summary report of the study.

## Limitations

The accuracy with which a subject responded to questions in the survey booklet was limited by the personal experience and appraisal of that respondent.

## Basic Assumptions

1. Questions designed for the survey booklet facilitated the gathering of information appropriate to the purposes of this study.

2. Water exercise teachers who were survey distributors used the random selection process outlined in the researcher's instruction sheet to select survey respondents.

3. The sample of this investigation is representative of the population surveyed.

## Hypotheses

For the population surveyed, there is no significant difference among water exercise participants for water exercise workouts, or swimming ability; subject's reasons for participation or perceived major benefits; reported difficulties experienced with water exercise; techniques used to monitor water exercise intensity; patterns of participation in water exercise and other leisure fitness and sport activities for frequency and duration.

## Definition of Terms

*Person-to-Person Contact Sport.* Sport classification by McIntosh[7] in the *combat* sport group, involving personal contact with an opponent. Contact may be direct as in judo, or indirect, where a racquet or foil mediates contact between opponents.

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*[7] McIntosh, P.C., Sports in Society, pp. 126-127.*

*Person-to-Environment Conquest Sport.* Sport classification by McIntosh[8] in the *conquest* sport group, where the environment rather than an individual or group of opponents constitutes the challenge to participants. The impersonal appeal of this challenge is found in activities such as non-competitive swimming, or snow or cross country skiing, or SCUBA diving.

*Recreational/Leisure Sport.* Primarily individual and dual sport activities of a non-competitive nature. The challenge may be to the individual or provide opportunity to interact with an opponent, and involve skill in the control of body movement, sport implements or objects, and external forces.

*Respondent.* An individual who participated in water exercise regularly (a minimum of once weekly) and who completed the survey booklet.

*Survey Distributor.* A water exercise teacher selected by a table of random numbers, or a volunteer water exercise teacher, who agreed to distribute survey booklets to respondents by a process of random selection.

*Volunteer Water Exercise Teacher* (VWET). A teacher of water exercise who wrote or telephoned the researcher to request inclusion in this study.

Water Exercise Teacher. A member of the AEA, or YMCA Aquatic Director, who were selected by use of tables of random numbers to distribute survey booklets.

*Water Exercise.* For the purposes of this research, water exercise was defined as rhythmic movement performed in water at variable rates, repetitions, and levels of difficulty to tone major muscle groups of the body and maintain or improve selected elements of physical fitness. Distance or lap swimming, which is another form of physical exercise performed in water, was not the topic of this research.

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[8] *McIntosh, P.C., Sports in Society, pp. 126-127.*

# CHAPTER II

## REVIEW OF RELATED LITERATURE

Aquatic exercise programs are experiencing rapid growth in the United States. A state-of-the art report about water exercise, based upon the writer's review of written resources in this area and observation of such programs, supports the premise that widely diversified physical activities currently are incorporated into water exercise workouts. Water calisthenics, walking, jogging and jumping, and resistance type activities, performed singly or in some combination, in addition to lap swimming and adaptations of aerobic dance activities for water, illustrate this diversity.[1]

Books in this area also reflect differing approaches to in-water exercise. Aqua Yoga,[2] Aqua Dynamics,[3] Aqua Rhythmics,[4] and HydroRobics[5] are among the titles of current books. Evenbeck,[6] has hypothesized that water exercise teachers "have drawn from their backgrounds in competitive swimming, hydrotherapy, dance, weight training/conditioning, aerobic dance, synchronized swimming and water polo" to develop aquatic exercise courses.[7] The researchers surmise that authors, too, have drawn upon similar background experiences and training.

The YMCA was one of the first national organizations to recognize the need for teacher and program guidelines for water exercise. The manual, titled YMCA Physical Fitness Through Water Exercise,[8] was published in 1982. A fitness syllabus for water exercise teachers, authored by Fred Andres,[9] was developed in about 1985 by The Aquatic Council of the American Alliance for Health, Physical Education, Recreation and Dance. In 1987, according to Tom Werts,[10] then National Water Safety Director of the American Red Cross (ARC), ARC was in process of developing guidelines for programs and teachers of water exercise. Exercise manuals for water exercise teachers have been published by water exercise entrepreneurs such as Foord,[11] and others. Water exercise video tapes have been produced by Lange,[12] McCurdy,[13] and others. Written teaching materials also have been made available through symposiums for water exercise teachers on a regional basis. Some regional symposiums were conducted in 1987 by The Aquatic Exercise Association and its executive director Ruth Sova, with offices in Port Washington, Wisconsin.

The review of the literature indicated that no national organization or agency had developed standards for programs or teachers of water exercise, with exception of the Standards Committee of the National Advisory Committee on Aquatic Exercise (NACAE). NACAE, a special committee of the Council for National Cooperation in Aquatics (CNCA), has drafted "Proposed Standards for Aquatic Exercise Programs" and a "Position Statement on Aquatic Exercise," (see Appendix B).

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[1] *Evenbeck, Betty, "Aquatic Exercise Programming Taking Shape," Journal of Health, Physical Education, Recreation and Dance. 57:8, 22, 1986.*

[2] *Beck, Carol, Aqua Yoga: A New Approach for People of All Ages. Drake Publishers, Inc., New York, N.Y., 1978, 96 pp.*

[3] *Conrad, Casey, The New Aqua Dynamics: Water Exercises to Fit Any Body. The National Spa and Pool Institute, Alexandria, VA., 1985, 90 pp.*

[4] *Nolte-Heuritsch, Ilse, Aqua Rhythmics. Sterling Publishing Co., Inc., New York, N. Y., 1978, 96 pp.*

[5] *Krasevec, Joseph A., and Grimes, Diane C., HydroRobics, Leisure Press, Champaign, Il., 1985, 224 pp.*

[6] *Evenbeck, Betty, loc. cit.*

[7] *Ibid.*

[8] *YMCA of the USA, Physical Fitness Through Water Exercise, Human Kinetics Publishers, Champaign, Il., 1982, 69 pp.*

[9] *Andres, Fred, Co-director, Exercise Physiology Laboratories, Department of Health Promotion and Human Performance, University of Toledo, Toledo, Ohio.*

[10] *Werts, Tom, National Director of Water Safety, American Red Cross, National Headquarters, 17 and D Streets, N. W., Washington, D. C. 20006. Long distance telephone call November 13, 1987.*

[11] *Foord, Pauline B., Aqua X: The Comprehensive Aquatic Exercise Program, A-X Enterprises, San Marcos, Ca., 1987, 128 pp.*

[12] *Lange, Billie G., Slim and Trim Yoga With Billie In and Out of the Pool. Kudzi Productions, 1984. Available from Video Magalog - 1-800-999-9992, Carlstead Ca., or Navy Exchange, Orlando, Fl.*

[13] *McCurdy, Mindy, Mindy McCurdy's Aquasize. Mindy McCurdy, Inc., Naples, Fl.*

An increase in the body of knowledge about water exercise, and written information based upon scientific study, appeared to be a current need of water exercise participants, teachers and program directors.

Articles directly related to water exercise and available to the professional water exercise teacher and general public in journal and newsletter publications by selected authors, aquatic or fitness related organizations have helped to fill this void. The handbook by the American College of Sports Medicine,[15] and selected other textbooks on the subject of physical fitness and related research, however, currently provide information essential to the teacher of water exercise.

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[15] *American College of Sports Medicine, Guidelines for Exercise Testing and Prescription, Lea and Febiger, 3rd Edition, Philadelphia, 1986, 179 pp.*

# CHAPTER III

## METHODS AND PROCEDURES

This study was concerned with water exercise participants for the purpose of gathering demographic data about participants; data about typical water exercise workouts and associated practices; data about medical clearance to water exercise and physical conditions or problems of respondents; data about subjects' reasons for participation, frequency of participation, and average number of participation days per week; and data about other leisure time fitness and sport activities to investigate frequency of participation and average number of participation days per week to cover about 18 different activities.

### General Procedures

Preliminary Arrangements. Phase I, The National Survey of Water Exercise Participants, was developed by the principal researcher during a leave of absence from Ball State University, Autumn Quarter of 1987, as part of a four-phase research investigation of water exercise. It was projected that Phase II, National Water Exercise Teacher/Program Survey; Phase III, Development of Standards for Water Exercise Programs in the United States; and Phase IV, a National Water Exercise Symposium, would follow Phase I sequentially. Phase I was undertaken during the academic year, 1987-88.

Media Specialist. In early summer of 1987, a media specialist was engaged to prepare national news releases for two major reasons: (1) to announce this national survey and, (2) to solicit the cooperation of teachers of water exercise throughout the United States to serve as primary distributors of the survey instrument to students.

Announcements of the survey, printed in professional journals and newsletters included: Aqua Notes, Newsletter of the ARAPCS Aquatic Council of the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD), October of 1987; National Journal of Aquatics, of the Council for National Cooperation in Aquatics, Fall of 1987; The AKWA Letter, by the Aquatic Exercise Association, September of 1987; and the Journal of Health, Physical Education, Recreation and Dance, by AAHPERD, October of 1987. Selected news releases are shown in Appendix C.

In October of 1987, editors of six selected trade magazines were mailed news releases together with cover letters to solicit their cooperation in announcing the survey. A sample news release for trade magazines is shown in Appendix C.

Communication with Professional Colleagues and Organizations/Agencies. To announce the projected national survey of water exercise participants, in excess of thirty research packets were prepared in the autumn of 1987, detailing the projected four-phase study. These packets were mailed to selected professional individuals, and international and national fitness-related organizations/agencies.

In the autumn of 1987 and winter of 1988, the principal researcher spoke with more than sixteen selected individuals and agencies to discuss the projected water exercise survey of participants and/or to explore external funding of the project.

Volunteer Water Exercise Teachers (VWET). In response to the national news releases about this projected investigation, over seventy teachers of water exercise wrote or telephoned the principal researcher to indicate an interest in involvement in the project.

External Letters of Support. Letters of endorsement of this study were solicited and received from eight international and national aquatic and fitness related organizations. Letters received included: C. Carson (Casey) Conrad, former Executive Director, The President's Council on Physical Fitness and Sports; Don J. DeBolt, Executive Director, International Swimming Hall of Fame, Inc.; Connie Coughenhour, Chair, the National Forum for Advancement of Aquatics, Inc.; Kent J. Blumenthal, Chief, Information Resource Center, National Recreation and Park Association; Ash E. Hayes, Exeuctive Director, President's Council on Physical Fitness and Sports; Louise Priest, Executive Director, Council for National Cooperation in Aquatics; and W. Dennis Berry, Chair, Aquatic Council of the American Alliance for Health, Physical Education, Recreation and Dance. External letters of support are shown in Appendix E.

Development and Field Testing of the Survey Instrument. The principal researcher used a format fashioned by Dillman[1] to design the survey. The survey instrument was developed in June/July of 1987. The instrument was field tested early August of 1987 by twenty-four undergraduate students at Ball State University who were enrolled in a water exercise class taught second semester of 1987 by the principal researcher. The survey instrument was revised on the basis of this field test.

Computer Specialist. A computer specialist was engaged to format, type and arrange for laser printing of the survey instrument.

Design of the Teachers Questionnaire and Letter of Invitation to Water Exercise Teachers for Survey Distribution. A letter was drafted and mailed to water exercise teachers and VWET inviting their participation in the research study as primary receivers of the Water Exercise Participant Survey. This letter is shown in Appendix A. These water exercise teachers were asked to respond to this letter of invitation by completing nine questions contained in the Water Exercise Teacher Questionnaire, together with their name and address. The Water Exercise Teacher Questionnaire is shown in Appendix A.

In addition to the researcher's letter of invitation and Water Exercise Questionnaire, either the endorsement letter by C. Carson Conrad, former Executive Director of The President's Council on Physical Fitness and Sports, or Kent J. Blumenthal of the National Recreation and Park Association, were randomly enclosed (see Appendix E).

Development of the Instruction Sheet for Subject Selection by Water Exercise Teachers. A one-page form was drafted by C. Van Nelson, researcher, to provide direction to water exercise teachers for random selection of respondents. This form, together with the survey instruments, was mailed to water exercise teachers who were willing to serve as primary receivers of the surveys. This "Direction Sheet" is shown in Appendix A.

Development of the Return Postcard. A postcard, size 3-1/2" X 5-1/2" was designed for circulation to survey participants. Purposes to be served by return of the postcard by respondents were: (l) to report completion and return of the survey in a separate mailing; (2) to request a summary or complete copy of the survey results; and (3) to indicate whether or not an individual was willing to participate in a future update survey. Postage paid postcards were stuffed into each survey instrument for distribution to respondents. The postcard is shown in Appendix A.

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[1] *Dillman, Don A., Mail and Telephone Surveys: The Total Design Method, Wiey Interscience Publications, New York, NY, 1978, 325pp.*

Securing Mailing Lists and Labels . Research packets which detailed the proposed research investigation were mailed to The American Exercise Association (AEA), through Ruth Sova, founder and executive officer, and to the YMCA of the USA, through Myrtis Meyer, Director of Research. Follow-up by the principal researcher, by mail and telephone, was made to request the cooperation of each organization in the research project. In response to this request, mailing lists and labels for the AEA membership, and for YMCA Aquatic Directors were made available to the researcher.

Selection of Water Exercise Teachers for Distribution of the Survey Instrument. Water exercise teachers, representative of a cross section of the United States, were selected by use of two tables of 1000 numbers, in random order, provided by Dr. C. Van Nelson, Research Design Consultant at Ball State University. Fifteen percent of the 1120 members of the American Exercise Association (A.E.A.) and ten percent of the 444 Y.M.C.A. Aquatic Directors had been assigned numbers and selected at random to be survey distributors. A third population of volunteers consisted of seventy-five water exercise teachers who had responded to the national news releases about the water exercise project.

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## Resume of Procedures

Teachers of water exercise who were selected by a random process, and V.W.E.T., received letters inviting them to be survey distributors of quantities of survey booklets, and a Teacher Questionnaire. In the event of rejection to the invitation for survey distribution by water exercise teachers, the researchers did not replace a number with a new number, for the sample size was adequate without replacement.

Teachers who responded affirmatively to the invitation for survey distribution received an instruction sheet and written directions for random selection of subjects, together with ten survey bookets.

Survey respondents, who were guaranteed anonymity, completed and returned a post card to the principal researcher in separate mailings to indicate completion of the survey and whether they wished a complete report or summary of the study, together with their name and address. All postage was paid. Computer Services at BSU completed the statistical analysis of the data.

# CHAPTER IV

## ANALYSIS AND INTERPRETATION OF THE DATA

### Demographic Data for Water Exercise Teachers

This chapter contains the presentation and discussion of the data from the respondents of the survey. Descriptive data are presented in tabular form for the important questions asked in the survey instrument. Differences between age categories on physical and social benefits of water exercise have been calculated and are also presented in this chapter.

Invitation to Distribute the Survey to Participants. Of the one hundred forty-two water exercise teachers who returned the Water Exercise Teacher Questionnaire, one hundred thirty-seven or 96.5 percent accepted the invitation to be primary receivers of the Water Exercise Participant Survey. Two, or 1.4 percent replied "no", and three, or 2.1 percent, did not respond to this question.

Active Teachers of Water Exercise. Of the teachers of water exercise who reported active involvement in the teaching of water exercise, thirty-six or 34.6 percent were YMCA teachers; twenty-four or 27.1 percent were members of the AEA; and seventy-two or 70.2 percent were VWET. Represented in the total of nine or 6.4 percent who were not teaching water exercise courses were: one or 2.3 percent, the YMCA; five or 1.9 percent, the AEA; and three or 4.8 percent, VWET. The data are shown in Table 1.

**TABLE I. Active Teachers of Water Exercise by Representative Group**

| | Y.M.C.A. | | A.E.A. | | V.W.E.T. | | Total | |
|---|---|---|---|---|---|---|---|---|
| Response | No. | % | No. | % | No. | % | No. | % |
| Yes | 36 | 34.6 | 24 | 27.1 | 72 | 70.2 | 132 | 93.6 |
| No | 1 | 2.3 | 5 | 1.9 | 3 | 4.8 | 9 | 6.4 |
| Total | 37 | 26.2 | 29 | 20.6 | 75 | 53.2 | 141 | 100.0 |

*Analysis and Interpretation.* The typical water exercise teacher in this sample population was an active teacher of water exercise (93.6%), associated with the YMCA (34.6%), the AEA (27.1%), or a VWET (70.2%); accepted the invitation to distribute surveys to water excercise participants (96.5%); female (90.1%); 20 to thirty-nine years of age (69%); and had a college/university undergraduate degree (34.5%), or an advanced (masters or doctorate) degree (27.5%). Of the pools used to teach water exercise, the highest percentages were recorded for: YMCA pool (35.9%); Fitness Club Pool (22.5%); City Recreation Department Pool (19%); and YWCA pool (8.5%). Of these water exercise teachers, some had conducted special water workshops (27.5%), and a relatively larger percentage had a background of special water workshops (61%). Water exercise teachers (96.5%) in this sample were willing to participate in the Water Exercise Teacher/Program Survey in 1988.

## Demographic Data for Water Exercise Participants

Sex. Of the 1180 subjects in this sample, one thousand sixty-two or 90 percent were female, and one hundred three, or 8.7 were male. Demographic data is shown in Appendix I.

Age Bracket. Each subject identified his/her age in one of four age brackets. Reported by the number of respondents within each bracket, together with percentages calculated from these data, the representation by age bracket was: Under 20 Years, thirty-seven or 3.1 percent; 20-39 Years, two hundred ninety-three or 24.8 percent; 40-59 Years, four hundred fourteen or 35.1 percent; and 60 Years and Up, four hundred twenty or 35.6 percent.

For further delineation, the numbers and percentages for each of the two age brackets of 35 Years or Younger, and 40 Years or Older, were combined and totaled. The results were: three hundred thirty or 27.9 percent were thirty-nine years of age of younger, and eight hundred thirty-four or 70.7 percent, were forty years of age or older.

Marital Status. Five groupings were used by respondents to identify marital status. The largest of the five groups was in the "married" category for eight hundred fifty-seven, or 72.6 percent of the respondents. The remaining four groups were: "single," "widowed," "divorced," and "separated." For reporting purposes, the numbers and percentage calculations for these 4 groupings were combined because regardless of former marital status, these groupings share the common demoninator of singleness. Three hundred-nine or 26.2 percent of the respondents were in the singleness category.

Education. Seven listed categories were used to identify the educational levels common among residents of the United States. Of these 7 categories, the extreme ends of the continuum were: "less than high school diploma," and "multiple advanced degrees," represented by fifty-two or 4.4 percent and fifteen, or 1.3 percent of the respondents, respectively. For the remaining educational categories, the numbers of respondents and percentages calculated from the data were: "high school diploma, with three hundred seventy-five or 31.9 percent; "junior college or equivalent," with two hundred sixty-six or 22.5 percent; "college/university undergraduate degree," with three hundred eleven or 26.4 percent; "multiple college/university undergraduate degrees," with forty-one or 3.5 percent; and "advanced degree (master-doctorate)", with one hundred thirty-seven, or 11.6 percent.

Current Employment Status. Five hundred three or 42.6 percent of the respondents "worked." Three hundred fifty-five or 30.8 percent of the respondents were "retired," of whom forty-eight or 4.1 percent reported "part-time work." Three hundred one or 25.5 percent, and fifty-eight or 4.9 percent of the respondents were "household engineers," i.e., homemakers, or "in school," respectively.

Some respondents reported employment status in more than one of the seven listed options in the survey. To illustrate, an individual who checked "in school," could also have "worked part-time," or "full time." This rationale afforded an explanation of the mismatch between expected total percent of 100 and the total reported percentage of 103.8, which was calculated for this section on the basis of subject's responses.

Residence by District. The number of respondents from each state, by district, are reported in descending order of representation with the number of respondents represented per state shown in parenthesis.

*Northeast District.* States represented were; New York,(92); Massachusetts, (54); Pennsylvania, (49); Virginia, (37); New Jersey, (34); Connecticut, (19);

Rhode Island, (13); Maryland (9); New Hampshire, (8); Vermont, (5); District of Columbia, (3); Delaware, (0); Maine, (0); and, West Virginia, (0).

*Southeast District.* States represented were: Georgia, (22); Mississippi, (15); South Carolina, (14); North Carolina, (12); Alabama, (9); Florida, (6); Tennesse (0); and Kentucky, (0).

*North Central District.* States represented were: Wisconsin, (139); Indiana, (107); Illinois, (63); Ohio, (51); Iowa, (28); Minnesota, (20); Michigan (3); North Dakata, (1); South Dakota, (0); and Nebraska, (0).

*South Central District.* States represented were: Texas, (70); Colorado, (45); Kansas, (35); Louisiana, (32); Oklahoma, (13); New Mexico, (6); Missouri, (5); and Arizona, (0).

*Western District.* States represented were; California, (53); Washington, (38); Idaho, (18); Utah, (13); Hawaii, (8); Nevada (3); Montana (2); Arizona, (2); Arkansas, (0); Wyoming, (0); and Oregon, (0).

*Analysis and Interpretation.* The typical water exercise participant in this sample was female (90%), 40 years of age and older (70.7%); married (72.6%), and college educated (66.9%). Participants tended to be either employed in full or part-time work (42.6%), or retired, with or without part-time work (30.1%); and reported an annual income from all sources of from $25,000 to $40,000 (45.3%). For the population surveyed, ethnicity was relatively unimportant (10.1%).

The highest and lowest representation by district were: North Central District (34.5%), and the Southeast District (7.5%). The Northeast District (26.8%), the South Central District (27%), the South Central District (27%), and the Western District (12.1%), were in the mid-range for representation by district.

## Data for Years, Frequency and Duration of Participation

Years of Participation. Of the respondents who reported participation in water exercise a minimum of once weekly, four hundred sixty-eight or 39.7 percent, had participated for less than one year. Six hundred ninety or 58.5 percent of the respondents had exercised from one to 5 years of more. Seven or 6.6 percent of the respondents did not water exercise regularly. These data are shown in Table 2.

*Analysis and Interpretaton.* The attraction and retention aspects of water exercise gained support from respondents who reported continuation of water exercise beyond 1 year and upward to five or more years. On the basis of these data, first year or new clientele (39.7%) represented a lower percentage of the total participants, in comparison to returning clients, that is, those reporting participation beyond 1 year (58.5%). Respondents who have water exercised for 5 or more years (13.8%) exhibited a tendency toward "water dependency or addiction." Unknown are the reasons, if any, that participants stopped water exercising, whether in an instructional or non-instructional setting.

**TABLE 2. Years of Participation**

| Number of Years | No. | % |
|---|---|---|
| Less than 1 year | 468 | 39.7 |
| 1-2 years | 297 | 25.2 |
| 3-4 years | 230 | 19.5 |
| 5 or more years | 163 | 13.8 |
| Do not exercise regularly | 7 | 6.6 |
| Total | 1065 | 98.8 |

Exercise addiction has been defined by Sachs and Pargman as, "Psychological and/or physiological dependence upon a regular regimen of physical activity."[1] Pargman and Burgess,[2] have suggested that consistent and intense exercise are probably requisite for development of exercise dependency. For these researchers, factors such as improved sense of physical well-being, and optimum levels of arousal found in non-athletic environments, are aspects of exercise dependency. Midtlyng,[3] who studied the stress response of women in advanced hunt horsemanship at Indiana University, recommended study of the factors that motivated and sustained the participation of these women. Of importance were environmental factors in the stable and jumping arena that contributed to optimal stimulation, which may facilitate an individual's overall performance. The psychological and physiological factors that may impel certain individuals to water exercise in a regular and sustained fashion, and of such individuals, are worthy of study.

Frequency of Participation. Six hundred six or 51.4 percent of the sample, water exercised less than 3 days weekly, whereas five hundred twelve or 43.3 percent of the sample water exercised from 3-4 days weekly. Forty-six or 3.9 percent of the sample water exercised five or more days weekly, whereas seven or .3 percent of the sample did not water exercise regularly. These data are shown in Table 3.

**TABLE 3. Frequency of Participation Weekly**

| Number of Days | No. | % |
|---|---|---|
| Less than 3 days | 606 | 51.4 |
| 3-4 days | 512 | 43.3 |
| 5 or more days | 46 | 3.9 |
| Too varied to respond | 3 | .3 |
| Total | 1167 | 99.9 |

*Analysis and Interpretation.* A majority of the respondents water exercised less than 3 days weekly (51.4%). In comparison, the total percentage of respondents who exercised 3-4 days weekly (43.4%) and those who exercised 5 or more days weekly (3.9%) represented approximately half of the population surveyed (47.2%)

The frequency or number of days that respondents water exercised may be related, in part, to pool management policies, such as; daily or weekly availability of a pool for water exercise, either for a fee or free to the public; number and duration of water exercise classes scheduled per day and weekly by the pool or aquatic director. Further, the number of qualified water exercise teachers available to staff such a program, if limited, or lack of information about the benefits and attractiveness of water exercise for the general public, may adversely affect the number of classes scheduled by management. It is projected that factors which influenced current and prospective water exercise clientele include: feasibility of taking lessons based upon cost of water exercise classes per day or week, or the projected cost of a water exercise package made available to the public; relative satisfaction experienced by participants from water exercise workouts; health, transportation or other limitations which affect the frequency of participation.

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[1] *Sachs, Michael I, and Pargman, David, "Examining Exercise Addicition: A Depth Interview Approach, Paper presented at the Annual Conference, North American Society for the Psychology of Sport and Physical Activity, Tallahasses, Florida, May 24, 1978, p. 3.*

[2] *Pargman, David and Burgess, Sharon S., "Hooked on Exercise: A Psycho-biological Explanation," Motor Skills: Theory Into Practice. Vol. 3, No. 2, p.116, 1979.*

[3] *Midtlyng, Joanna, Stress Responses of Women in Advanced Hunt Horsemanship at Indiana University. Unpublished doctoral thesis, School of Health, Physical Education and Recreation, Indiana University, Bloomington, In., 1971, p. 153*

Duration of the Water Exercise Workout. Of the five time options listed in the survey for exercise duration, nine hundred twenty-five or 78.4 percent of the respondents water exercised for "more than 40 minutes per session." Two hundred twenty-one or 18.7 percent of the respondents water exercised from "twenty-five to 40 minutes per session." For a single session, twenty-one or less than 2 percent of the respondents exercised for "less than 25 minutes," and two or .2 percent reported that their water exercise workout was too varied to respond. These data are shown in Table 4.

**TABLE 4. Duration of Each Water Exercise Workout**

| Number of Minutes | No. | % |
|---|---|---|
| Less than 15 minutes | 5 | .4 |
| 15-25 minutes | 16 | 1.4 |
| 25-40 minutes | 221 | 18.7 |
| More than 40 minutes | 925 | 78.4 |
| Too varied to respond | 2 | .2 |
| Total | 1169 | 99.1 |

*Analysis and Interpretation.* For duration of a single water exercise workout, the most frequently reported pattern in this survey was "40 or more minutes" (78.4%), and secondly, 25-40 minutes. (18.7%) The report that a few respondents exercised from fifteen to 25 minutes, or less than 15 minutes, appears to reflect the flexibility of scheduling which may be designed to accommodate water exercising within the time limitations of clients; or needs of special populations; or persons with low functional capacities; or simply attract the individual who is capable of a high intensity-short duration water exercise session. According to the American College of Sports Medicine (ACSM), in reference to exercise duration, "significant cardiovascular improvements have been obtained with exercise sessions of 5 to 10 minutes' duration with an intensity of more than 90 percent of functional capacity."[5] The ACSM cautions, however, that exercise sessions with lower intensities and longer durations are best suited to most sedentary or symptomatic participants[6].

## Data for Respondents' Swimming Ability, Pool Used, Time of Day, and Flotation Devices or Other Supplies Used to Water Exercise

Swimming Ability of Respondents. Seven hundred seventy-two or 65.4 percent of the 1180 survey respondents were deep water swimmers, which included those with a background of competitive swimming. Three hundred sixty-five or 30.9 percent of the participants were limited to shallow water by swimming ability. Of the shallow water participants, one hundred five were non-swimmers, or 6.9 percent, and two hundred sixty, or 22 percent, were novice swimmers. These data are shown in Table 5.

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[5] *American College of Sports Medicine, Guidelines for Exercise Testing and Prescription. Lea and Febiger, 3rd Edition, Philadelphia, 1986, p. 41.*

[6] *Ibid.*

**TABLE 5.**
**Swimming Ability of Respondents**

| Swimming Ability | No. | % |
|---|---|---|
| Non-swimmer | 105 | 8.9 |
| Novice/limited to shallow water | 260 | 22.0 |
| Swimmers/deep water | 693 | 58.7 |
| Competitive swimming background | 79 | 6.7 |
| Other, specify | 42 | 3.6 |
| Total | 1179 | 99.9 |

In the category, "other, specify," for identification of swimming ability, thirty respondents reported that they were lifeguards and/or water safety instructors, or swimming examination instructors. A limited number were distance or synchronized swimmers. Of the six who reported relatively pool swimming ability, two indicated that they exercised in deep water. One respondent reported being terrified of deep water. These data are shown in Appendix G.

*Analysis and Interpretation.* A majority of the respondents in this sample were deep water swimmers (65.4%). The percentage of individuals who were either novices or non-swimmers (30.9%), provide an indication of the appeal that water exercise has for the general public, and implies an ability among these teachers to select water exercises for special populations, such as non-swimmers.

Data for self-reported swimming ability were compared with data for a typical water exercise workout (see p. 42). The percentage of non-swimmers and novices was totaled (30.9%), as was the percentage for reported deep water swimmers and respondents with competitive swimming background (65.4%). These percentages for shallow and deep water participants were compared with the data for respondents who reported that they water exercised only in shallow water or at the pool wall (41.3%)

While non-swimmers and novices remained in shallow water or at the pool wall to exercise, a small percentage of deep water swimmers in this sample, (10.4%) also remained in shallow water to exercise. Either participants' personal or instructional preference influenced this reported percentage of deep water swimmers who limited their exercise to shallow water. Given the viability of instructional preference, influential factors may include the instructor's perceived need to: (1) design and conduct exercise workouts based primarily upon the swimming ability of non-swimmers and novice swimmers in the water exercise class; (2) work within the instructor's lifesaving capabilities in water and/or recognized aquatic teaching certification; and, (3) other factors such as the policies and procedures of the pool director or owner.

Pool Used to Water Exercise. A wide range of options was listed in the survey for respondents to identify pool or pools used to water exercise. Pools used to water exercise are reported in the 4 categories of: agency pool, educational pool, club pool, and non-categorized pools. The data are shown in Table 6. The number of respondents specifying each pool and percentages calculated from these data follow each listed pool.

> *Agency Pools*: YMCA pool, three hundred seventy-nine or 32.1 percent; and YWCA pool, one hundred forty-nine or 12.6 percent.
>
> *Educational Pools*: college/university pool, one hundred seventy-nine or 15.2 percent; and public school pool, forty-eight or 4.1 percent.
>
> *Club Pools*: Fitness Club Pool, one hundred thirty or 11.0 percent; and Country Club Pool, nineteen or 1.6 percent.
>
> *Non-categorized Pools*: City Recreation Department Pool, one hundred ninety-two or 16.3 percent; own or neighbor's private

pool, eighteen or 1.5 percent; instructor's private pool, eighteen or 1.5 percent; and corporate or employee pool, three or .3 percent.

**TABLE 6.**
**Pool Used to Water Exercise***

| Pool | No. | % |
|---|---|---|
| City Recreation Pool | 192 | 16.3 |
| College/university pool | 179 | 15.2 |
| Corporate or employee pool | 3 | .3 |
| Country club pool | 19 | 1.6 |
| Fitness club pool | 130 | 11.0 |
| Instructor's private pool | 11 | .9 |
| Own or neighbor's pool | 18 | 1.5 |
| Public school pool | 48 | 4.1 |
| YMCA | 379 | 32.1 |
| YWCA | 149 | 12.6 |
| Other, specify | 84 | 7.1 |

** Respondents could identify more than one pool.*

In the category, "other, specify," the most frequently listed pools for water exercise reported by respondents were: hospital/wellness/ therapeutic pool; recreational facility pools; and motel pools. Data for pool usage are shown in Appendix G.

*Analysis and Interpretation.* Agency pools of the YMCA and YWCA were most frequently used by respondents to water exercise (44.7%). Educational pools at colleges or universities or public school pools (19.3%), city pools through the recreation department (16.3%), and the club pools of fitness clubs and country clubs (12.6%), serviced relatively fewer water exercise clients, but collectively provided opportunity to water exercise for a sizeable percentage of individuals (48.2%). Among this population, corporate and private pools were used to water exercise by a comparatively small number of participants (2.7%). The reported use of hospital/wellness/therapeutic pools and motel pools for water exercise may reflect a trend.

Time of Day to Water Exercise. Reported in descending order, by number of respondents per response option and percentages calculated from the data, six hundred eighty or 57.6 percent of the respondents water exercised in the morning hours, between 7 a.m. and noon. Three hundred fifty-three or 29.9 percent exercised in the early evening hours, from 5 p.m. to 9 p.m., whereas one hundred eighty-seven or 15.8 percent of the respondents exercised in the afternoon hours, from noon to 5 p.m. Four of the respondents water exercised in the late evening hours, after 9 p.m., whereas for 7 individuals the exercise session was too varied to respond. The data are shown in Table 7.

**TABLE 7.**
**Time of Day for Water Exercise**

| Time of Day | No. | % |
|---|---|---|
| Morning hours (7 a.m. to noon) | 680 | 57.6 |
| Afternoon hours (noon to 5 p.m.) | 187 | 15.8 |
| Early evening hours (5 to 9 p.m.) | 353 | 29.9 |
| Late evening hours (after 9 p.m.) | 4 | .3 |
| Too varied to respond | 7 | .6 |
| Total | 1231 | *104.2 |

* Some respondents identified more than one time of day.

*Analysis and Interpretation.* For a majority of the respondents, choice time of day to water exercise was during the morning hours, from 7 a.m. to noon (57.6%). In contrast, the afternoon hours, from noon to 5 p.m., attracted a relatively small number of patrons (15.8%), and the late evening hours, after 9 p.m., had excessively limited numbers of participants (0.3%). The early evening hours, from 5 to 9 p.m. ranked second among these time choices (29.9%).

Flotation Devices and Other Supplies Used to Water Exercise. Respondents identified 5 flotation devices or other supplies used to water exercise, with one foil for "none of the above," and provision for write-in additions. In descending order, the number of respondents who checked each listed item and the percentages calculated from the data were: (1) flutter boards, by seven hundred twenty-five or 61.4 percent; (2) plastic bottles, by four hundred fifty-six or 38.6 percent; (3) hand/wrist weights, by one hundred thirty-eight or 11.7 percent; (4) ankle weights, by seventy-nine or 6.7 percent; (5) flexible nylon gloves, by four or .3 percent; and (6) none of the above, by two hundred seven or 18.5 percent of the respondents. These data are shown in Table 8.

**TABLE 8. Flotation Devices and Other Supplies Used***

| Item | No. | % |
|---|---|---|
| Flutter boards | 725 | 61.4 |
| Plastic bottles | 456 | 38.6 |
| Flexible nylon gloves | 4 | .3 |
| Hand/wrist weights | 128 | 11.7 |
| Ankle weights | 79 | 6.7 |
| None of the above | 207 | 18.5 |
| Other, specify | 172 | 14.6 |

** Respondents could identify more than one flotation device or other supplies.*

In the category, "other, specify," one hundred seventy-two or 14.6 percent respondents added the flotation devices of balls; inflatable arm and leg supports; water wings; small inner tubes; pool buoys; floats on wrists and ankles; and life preservers. For resistance devices, respondents wrote-in: fluggels (arms and legs); plastic hand sized containers, such as Cool Whip bowls; hand paddles; plastic plates; surgical tubing tied into a circle; and swim fins. Items added by respondents of a game nature included: rings and frisbies. Rubber sandals was added by one respondent, and classified as wearing apparel. A complete listing of flotation devices and other suppplies added by respondents is shown in Appendix G.

*Analysis and Interpretation.* The most frequently used flotation devices reported by respondents were flutter boards (61.4%), and plastic bottles (38.6%). Hand/wrist weights (11.7%), ankle weights (6.7%), and flexible nylon gloves (0.3%) were supplies used to water exercise by relatively few numbers of participants. Write-in additions by respondents of other flotation and resistance devices used to water exercise, such as Cool Whip bowls and plastic plates, indicate either that participants or teachers, or both, were fairly ingenious in their use of materials to water exercise that are readily available in most homes. Cost and suitability of flotation and other supplies currently marketed, are factors which probably affect usage by participants.

## Water Exercise Instructional Patterns and Teaching Procedures

Water Exercise Instructional Patterns. Respondents identified instructional patterns for water exercise from five listed options in the survey. "Formal instruction by one teacher," was the dominate pattern for one thousand seventy or 90 percent; followed by "formal instruction by team teachers," for seventy-four or 6.3 percent; and "self- instructed," for twenty-six or 2.2 percent. "Informal instruction by group members," and "not instructed," were reported by five or 4 percent, and two or 2 percent of the respondents respectively. These data are shown in Table 9.

**TABLE 9. Water Exercise Instructional Patterns**

| Instructional Options | No. | % |
|---|---|---|
| Informally by group members | 5 | 5.4 |
| Formally by one teacher | 1070 | 90.7 |
| Formally by team teachers | 74 | 6.3 |
| Self-instructed | 26 | 2.2 |
| Not instructed | 2 | .2 |
| Total | 1177 | 99.8 |

*Analysis and Interpretation.* For the population surveyed the dominate pattern was formal instruction by one teacher (90.7%), although, formal instruction by team teachers was a reported pattern (6.3%). Individuals who were self-instructed, or instructed informally by group members, or not instructed, accounted for a neglible percent of this sample (2.8%).

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## Data for Locations of the Warm-up and Main Exercise Workout

Location of the Warm-up. An out-of-water location to warm-up using the "pool deck" was reported by fifty-five or 4.7 percent of the respondents. In contrast, for seventy-two or 6.1 percent of the respondents, a warm-up was "seldom" or "not" incorporated into the water exercise workout. These two responses constituted the two extreme ends of the continuum for warm-up practices, with exception of a "combination of locations." The data are shown in Table 10.

**TABLE 10. Location of the Warm-Up**

| The Warm-up | No. | % |
|---|---|---|
| Pool Deck | 55 | 4.7 |
| Shallow water | 725 | 61.4 |
| Deep water | 78 | 6.6 |
| Both shallow and deep water | 218 | 18.5 |
| Combination of locations | 50 | 4.2 |
| Seldom or no warm-up | 72 | 6.1 |
| Total | 1153 | 101.5* |

** Some respondents identified more than one location.*

When the warm-up was reported in "open water," seven hundred twenty-five or 61.4 percent of the respondents used shallow water, whereas, for seventy-eight or 6.6 percent of the respondents, the warm-up was in deep water. The use of "both shallow and deep water," or a combination of locations" to warm-up were reported by two hundred eighteen or 28.5 percent, and fifty or 4.2 percent of the respondents respectively. The category, "combination of locations," was interpreted to mean, use of the pool deck, and both shallow and deep water.

*Analysis and Interpretation.* A majority of the respondents and beyond used shallow water for the warm-up (61.4%). Location of the warm-up is dependent upon unknown factors such as water depths available to participants for water exercise. For the instructor, warm-up location in water would be influenced by the swimming ability of clientele. The report by some respondents that a warm-up was "seldom or never used," (6.1%), and use of the pool deck to warm-up (4.7%), were findings that represent atypical practices among these water exercise participants.

Location of the Main Workout. The side of the pool was used for the main water exercise workout by one hundred eighty or 15.3 percent of the respondents, whereas, use of open shallow water was reported by three hundred nine, or 26.2 percent of the respondents. These data are shown in Table 11.

Open water, both shallow and deep, and a combination of locations were reported by three hundred sixty-three or 30.8 percent and five hundred five or 42.8 percent of the respondents, respectively.

**TABLE 11. Location of the Main Water Exercise Workout**

| Main Exercise Workout | No. | % |
|---|---|---|
| Side of pool | 180 | 15.3 |
| Open water/ shallow water only | 309 | 26.2 |
| Open water/ both shallow & deep water | 363 | 30.8 |
| Combination of locations | 505 | 42.8 |
| Total | 1195 | 115.1* |

** Some respondents identified more than one location.*

*Analysis and Interpretation.* A combination of locations for the main exercise workout, which included shallow and deep water and the side of the pool, was reported by the largest number of participants (42.8%), followed by use of shallow and deep water (30.8%). The prevalent practice of using a combination of locations for the main exercise workout, enables instructors to accommodate participants whose swimming abilities differ, and to utilize a variety of water exercises at the pool wall as well as shallow and deep water.

Recovery Techniques Between Vigorous Exercises. Less vigorous or breathing exercises to recover between periods of hard vigorous water exercise were reported by seven hundred seventy-nine or 66 percent of the respondents. In contrast, one hundred seventy or 14.4 percent of the respondents reported that water exercise workouts were "seldom or never vigorous."

For two hundred twenty-four or 19.0 percent of the respondents, neither "less vigorous nor breathing exercises" were used between periods of hard vigorous water exercise.

*Analysis and Interpretation.* The data reporting respondents use of less vigorous or breathing exercises to recover between periods of hard vigorous water exercise require amplification. A number of deductions are proposed by the researchers which relate to each of the reported practices for recovery between periods of hard vigorous exercise. First, for respondents who reported use of less vigorous or breathing exercises to recover between hard, vigorous exercise workouts (66%), it is likely that less vigorous, rather than breathing exercises were employed. This supposition is supported by data from the section titled, "Profile of a Typical Water Workout," which reported that breathing exercise was incorporated in the water exercise workout "rarely to none of the time" (83%).

Second, the report by some respondents that water exercise workouts were "seldom or never vigorous" (14.4%), negated the need to vary the pace or intensity of the water exercise for these participants. Additionally, for respondents who used neither less vigorous nor breathing exercises between periods of hard vigorous water exercise (19%), three hypotheses are advanced, as follows: (1) either these subjects were capable of sustaining a high intensity water exercise workout for an unspecified time, without intermittent rest or moderation of the exercise intensity; or (2) the water exercise workout ought not have been characterized as hard, vigorous exercise; or (3) the water exercise workout was of relatively short duration.

Auditory Input Via Taped or Recorded Music. Eight hundred five or 68.2 percent of the respondents reported that taped or recorded music usually accompanied their water exercise workout. In contrast, for two hundred seventy-five or

23.5 percent of the respondents, these sources of auditory input were "seldom or never" used. The response of "occasionally," was reported by ninety-five or 8.1 percent of the respondents.

*Analysis and Interpretation.* For reported use of auditory input as an accompaniment for water exercise, the extreme ends of the continuum were "yes" (68.2%), and"occasionally" (8.1%), with "seldom or never (23.5%) in the midrange. Data for auditory input were compared with data for the profile of a typical water exercise workout (see page 47), in which activities offered "most of the time" were reported. Exercise routines were incorporated into the water exercise session "most of the time" for a majority and beyond of the participants (60.1%). For exercise routines, the superimposed rhythm from taped or recorded music, serve to cue movement responses and relative energy expended by participants.

For water exercise classes that offered exercise routines "occasionally" or "seldom or never," it is proposed that taped or recorded music serve to direct the participants' attention away from the work or physical energy being expended, to focus attention on a popular musical "hit" and associated experiences or feelings, or to add novelty to the water exercise workout. Budgetary restrictions for purchase of records, tapes and/or sound equipment, time needed by instructors to select and secure suitable music for water exercise, and ability and time of instructors to choreograph water routines, or availability of choreographed water routines, may be factors which influence the use of taped or recorded music for some water exercise workouts.

## Data for Measuring Exercise Intensity, Pulse Rate Frequency and Ability of Respondents to Calculate Target Heart Rate

Measuring Exercise Intensity. Eight hundred fifty-five of the 1180 respondents, or 72.5 percent, reported that pulse rate was taken during the water exercise workout to estimate exercise intensity. Other reported measures of exercise intensity were: "increases in breathing rate," or "perceived level or best guess," identified by one hundred fifty-eight or 13.4 percent and eighty-nine or 7.5 percent of the respondents, respectively. In contrast, one hundred thirty-seven or 11.6 percent of the respondents did not monitor exercise intensity by the measures listed in this survey instrument. These data are shown in Table 12.

**TABLE 12. Measures of Exercise Intensity in Water Exercise***

| Measures of Exercise Intensity | No. | % |
|---|---|---|
| Pulse rate during exercise | 855 | 72.5 |
| Increases in breathing rate | 158 | 13.4 |
| Perceived level or best guess | 89 | 7. |
| Do not estimate | 137 | 11.6 |

** Respondents could select more than one measure.*

*Analysis and Interpretation.* For a majority of the respondents and beyond, pulse rate was taken to monitor exercise intensity (72.5%). Increases in breathing rate (13.4%), or perceived level or best guess (7.5%), which were other listed measures of monitoring exercise intensity, were used less frequently by this sample population. The reported percentage for respondents who did not monitor exercise intensity (11.6%), is interpreted as a need to train some water exercise teachers in monitoring techniques and the importance of teaching participants to measure their exercise intensity. On the other hand, some respondents may have chosen not to monitor their exercise intensity even after being instructed to do so.

Pulse Rate Frequency. In a single session, six hundred forty-one or 54.3 percent of the respondents reported that pulse rate was taken 1 to 2 times. For two hundred nine or 17.7 percent of the respondents, pulse rate was taken 3 or more times during the exercise workout. In contrast, for three hundred twenty-four or 27.5 percent of the respondents, pulse rate was seldom or never taken during the exercise workout to estimate exercise intensity. These data are shown in Table 13.

**TABLE 13. Frequency of Taking Pulse Rate in a Single Water Exercise Workout**

| Frequency | No. | % |
|---|---|---|
| 3 or more times | 209 | 17.7 |
| 1-2 times | 641 | 54.3 |
| Seldom or never | 324 | 27.5 |
| Total | 1174 | 99.5 |

*Analysis and Interpretation.* Approximately three-fourths of these respondents took their pulse during a single water exercise workout (72%). Of this number, in a single water workout, a majority of respondents took their pulse rate one to 2 times (54.3%), whereas others reported taking a pulse rate three or more times (17.7%). The number of respondents who reported that they seldom or never checked their pulse rate in a single water exercise workout (27.5%), indicates a need for in-service training to instruct some water exercise teachers in the importance and techniques of taking pulse rate to monitor exercise intensity, and need to teach this technqiue to water exercise clientile.

Calculating Target Heart Rate. Eight hundred ninety or 75.4 percent of the respondents reported an ability to calculate target heart rate, whereas, two hundred forty-five or 20.8 percent of the respondents did not know how to calculate target heart rate.

*Analysis and Interpretation.* Whereas a majority of the respondents and beyond, reported ability to calculate their target heart rate (75.4%), an unacceptable percentage of these respondents, (20.8%), were not able to do thiis calculation. This finding directs attention to the adequacy of preparation and training of some water exercise teachers and/or the ability of some respondents to retain this information, given that they had received instruction about calculating target heart rate.

## Data for Medical Clearance for Water Exercise, Physical Conditions or Problems, and Difficulties Experienced by Respondents with Water Exercise

Medical Clearance. This section of the survey investigated whether or not water exercise participants in this sample had secured a doctor's clearance to start water exercise. Five hundred ten, or 43.2 percent of the respondents had obtained medical clearance to start water exercise. In contrast, six hundred fifty-three or 55.5 percent of the respondents reported "no" medical clearance prior to starting water exercise.

*Analysis and Interpretation.* The data indicate that, among this survey population, medical clearance of participants prior to active participation in water exercise was not required in a majority of water exercise programs or classes. Unknown are screening policies or procedures for clientele which may or may not be incorporated by some water exercise programs or teachers.

Physical Conditions or Problems. Eight physical conditions or problems were listed in the survey for respondent identification. Arthritis, the most commonly reported physical condition, was checked by three hundred sixty-eight respondents, or 31.1 percent of the sample. Obesity, second most frequently identified physical condition, was checked by two hundred twenty-six or 19.2 percent of the sample. High blood pressure, third most frequently checked physical condition, was identified by two hundred two, or 17.1 percent of the sample. Physical conditions or problems identified by fewer than fourteen or 6 percent of the respondents were: recent surgery, heart disease, recent illness, pregnancy. One subject only checked "difficulty with water exercise," from the listed items. These data are shown in Table 14.

For four hundred seventy-one, or 40.6 percent of the respondents, none of the listed physical conditions or problems were functional (see Table 14). One hundred six, or 9 percent of the respondents, however, checked "other, specify," and used the space provided to write-in other physical conditions or problems not listed among the survey answer options.

A panorama of physical conditions or problems was reported by respondents (0.9%) in the write-in section called "other, specify." Back, neck or disc problems, were the physical conditions or problems most frequently added by respondents. The composite listing for this section, shown in Appendix G, indicated that for all other added listings, the range was from a high of five to a low of 1 respondent for any given physical condition or problem.

**TABLE 14. Physical Conditions or Problems of Respondents***

| Physical Condition or Problem | No. | % |
|---|---|---|
| Recent surgery | 62 | 5.3 |
| Recent illness | 21 | 1.8 |
| Obesity | 226 | 19.2 |
| Pregnancy | 18 | 1.5 |
| Arthritis | 368 | 31.2 |
| Heart Disease | 49 | 4.2 |
| High blood pressure | 202 | 17.2 |
| Difficulty with water ex. | 1 | .1 |
| None of the above | 479 | 40.6 |
| Other, specify | 106 | 9.0 |

** Respondents could identify more than one physical condition or problem.*

*Analysis and Interpretation.* For a relatively large number of respondents, the physical conditions or problems listed in the survey were non-functional (40.6%). Among the respondents who reported physical conditions or problems, commonly checked were: arthritis (31.1%), obesity (19.2%), and high blood pressure (17.1%). One respondent, only, reported difficulty with water exercise.

Given that the respondents in this survey population were able to exercise without the need of medical supervision, it is concluded that physical conditions or problems which were reported, did not interfere with subjects' over-all ability to water exercise. Further, because only one respondent identified the foil, "difficulty with water exercise," it appears that water exercise teachers or the subjects themselves were able to modify the intensity or type of in-water exercises, where necessary, to the satisfaction of most participants. In contradistinction, the report by respondents that water exercise workouts were "seldom or never vigorous" (14.4%), appears to indicate that some instructors rather consistently used water exercises that were low in exercise intensity for most or all water exercise workouts. This latter finding has implications for instructional design and incorporation of a wider range of exercise intensities within water exercise workouts. To counteract any tendency toward excessive inclusion of non-vigorous water exercise, procedures may be needed to identify participants who require exercise modification, if some instructors are to include a wider range of exercise intensities. Unknown are in-house screening procedures for water exercise participants (based on factors such as age and medical history) which may exist in some programs to guide instructors in the modification of exercise intensity for some clients.

According to Heikkinen[7], in reference to chronic diseases of the elderly, any question about whether or not physical conditions or problems limit a person's ability to exercise, involves a multitude of factors, such as that individual's perception of health, attitude toward exercise and lifestyle. Study of these and other factors in relation to the water exercise participant is needed.

Difficulty with Water Exercise. To report difficulty experienced with water exercise, if any, respondents were asked to select from among five listed options. A majority and beyond of the respondents in this sample, or 91.4 percent, reported "no difficulty experienced," with water exercise. Of the remaining respondents, fewer than 2 percent reported the difficulty of extreme breathlessness, or chest discomfort, or dizzy spells.

Fifty-three or 4.5 percent of the respondents selected the option,"other, specify," and used the space provided to write-in difficulties experienced that were not among the listed options. Reported difficulties with water exercise added through write-in statements by respondents were: some breathlessness; cramps at times; sometimes fatigued; muscle soreness; feet cramping. Write-in comments for reported difficulty with water exercise are shown in Appendix G.

*Analysis and Interpretation.* A majority and beyond of the respondents reported no difficulty experienced with water exercise (91.4%). Caution, however, needs to be used in analyzing these data in view of the finding that some instructional water exercise workouts were "seldom or never vigorous." (See *Analysis and Interpretation* preceding Table 21.) Use of relatively low water exercise intensities may preclude the experience of difficulty among some participants.

Of the respondents who added to the difficulties listed in the survey (9%) through the write-in section, fewer than 10 identified some breathlessness; cramps at times; muscle soreness; sometimes fatigued. For the remaining ten difficulties added by respondents, shown in Appendix G, reported difficulties ranged from a high of six to a low of 1 respondent.

## Data for Major Reasons for Water Exercising and Physical Fitness Elements Emphasized and Perceived Improved by Respondent

Major Reasons for Water Exercising. Six benefits of water exercise, commonly cited in the literature, were listed in the survey, from which respondents identified major reasons for water exercising. Four of the listed items referred to physical fitness elements, and two were associated factors. In descending order, respondent's major reasons for in-water exercise and the percentages calculated from the data were: (1) all-round body toning and firming, by 958 or 81.2 percent; (2) cardiorespiratory endurance, by 569 or 48.2 percent; (3) flexibility, by 467 or 39.6 percent; (4) taking inches off, by 309 or 26.2 percent; (5) muscular strength, by 209 or 17.7 percent; and (6) muscular endurance, by 207 or 17.5 percent. These data are shown in Table 15. One hundred twenty-seven or 10.8 of the respondents used the section "other, specify," to write-in other major reasons for water exercise, which are shown in Appendix G.

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[7] *Heikkinen, Eino, University of Jrvaskyla (Finland),"Gerontological Aspects of Physical Exercise", in Sports for Older Persons. Prepared by the Committee for the Development of Sport, Council of Europe, Strasbourg (France), p. 4.*

**TABLE 15.**
**Major Reasons for Participation***

| Major Reasons | No. | % |
|---|---|---|
| All round body conditioning | 958 | 81.2 |
| Cardiorespiratory endurance | 569 | 48.2 |
| Flexibility | 467 | 39.6 |
| Taking inches off | 309 | 26.2 |
| Muscular strength | 209 | 17.7 |
| Muscular endurance | 207 | 17.5 |
| Other, specify | 127 | 10.8 |

** Respondents could identify more than one major reason.*

Physical Fitness Element(s) Emphasized. Subject's ranked four listed physical fitness elements on the bases of relative emphasis each had received in their water exercise workouts, or responded to the foil, "no single emphasis." Provision was made for respondents to add write-in statements in the "other, specify," category.

In descending order, the physical fitness elements reported emphasized in water exercise workouts by respondents were: (1) cardiorespiratory endurance, by 802 or 68.0 percent; (2) flexibility, by 568 or 48.1 percent; (3) muscular strength, by 403 or 34.1percent; (4) muscular endurance, by 325 or 27.5 percent; and (5) no single emphasis, by 218 or 18.5 percent. These data are shown in Column 1 of Table 16.

Physical Fitness Element(s) Perceived Improved by Respondents. In descending order, the physical fitness elements perceived improved by respondents were: (1) flexibility, by 759 or 67.4 percent; (2) cardiorespiratory endurance, by 690 or 58.5 percent; (3) muscular strength, by 464 or 39.3 percent; and (4) muscular endurance, by 274 or 23.2 percent. These data are shown in Column 3 of Table 16.

**TABLE 16. Physical Fitness Element(s) Emphasized and Perceived Improved through Water Exercise by Respondents**

| *Column 1* Fitness Element Emphasized | | | *Column 2* Fitness Element | *Column 3* Fitness Element Perceived Improved | | |
|---|---|---|---|---|---|---|
| No. | % | Ranking | | Ranking | No. | % |
| 802 | 68.0 | 1 | Cardiorespiratory endurance | 2 | 690 | 58.5 |
| 325 | 27.5 | 4 | Muscular endurance | 4 | 274 | 23.2 |
| 568 | 48.1 | 2 | Flexibility | 1 | 759 | 67.4 |
| 403 | 34.1 | 3 | Muscular strength | 3 | 464 | 39.3 |
| | | | None are improved | | 40 | 3.4 |
| 127 | 10.8 | | Other, specify | | | |

*Analysis and Interpretation.* On the basis of these data, cardiorespiratory endurance (48.2), and flexibility (48.1%) were the two physical fitness elements most emphasized in water exercise workouts, and the elements ranked high for perceived improvement by respondents. The fitness elements of muscular strength and endurance reportedly received less emphasis in the water exercise workouts, and achieved correspondingly lower rankings for perceived improvement among the respondents. The data indicate a relative match in the judgement of respondents between emphasis and improvement of physical fitness elements included in water exercise workouts.

## Data for General Reasons for Water Exercise and Perceived Improvement of Selected Factors Through Water Exercise

General Reasons for Water Exercising. Respondent's identified general reasons for water exercising, from a list of seven commonly cited outcomes of water exercise, with provision for write-in comments. In descending order, based upon numbers of respondents checking each listed item, together with percentages calculated from this data, the general reasons to water exercise were: (1) all-round body conditioning, by 945 or 80.1 percent; (2) increased sense of well being, by 820 or 69.5 percent; (3) fun time, by 624 or 52.9 percent; (4) relaxing, by 588 or 49.8 percent; (5) being with other people, by 572 or 48.5 percent; and (6) improved appearance, by 423 or 35.8 percent. These data are shown in Table 17.

**TABLE 17. General Reasons of Respondents for Water Exercising***

| General Reasons to Water Exercise | No. | % |
|---|---|---|
| All round body conditioning | 945 | 80.1 |
| Increased sense of well being | 820 | 69.5 |
| Fun time | 624 | 52.9 |
| Relaxing | 588 | 49.8 |
| Being with other people | 572 | 48.5 |
| Improved appearance | 423 | 35.8 |
| No general benefit | 10 | .8 |
| Other, specify | 78 | 6.6 |

** Respondents could select more than one general reason.*

The category "other, specify," was used by 78 or 6.6 percent of the respondents who added: improvement in muscular strength and endurance; reduced blood pressure and stress; and overcoming early childhood fear of water. A complete listing of write-in statements to identify other general reasons for water exercising is shown in Appendix G.

General Factors Perceived Improved Through Water Exercise by Respondents. Of the six listed foils, four were factors potentially improveable through water exercise, one stated "no contribution," and one stated, "other." Other general benefits added by respondents are shown in Appendix G.

In descending order, and reported by the number of respondents checking each item and resultant percentages calculated from this data, the results were: (l) reduced stress level, by 810 or 68.6 percent; (2) weight loss, by 416 or 35.3 percent; (3) lower pulse rate, by 274 or 23.2 percent; (4) lower blood pressure, by 227 or 19.2 percent; (5) other, by 87 or 7.4 percent; and (6) no contribution, by 75 or 6.4 percent. These data are shown in Table 18.

**TABLE 18. General Factors Perceived Improved through Water Exercise by Respondents***

| General Factors | No. | % |
|---|---|---|
| Reduced stress level | 810 | 68.6 |
| Weight loss | 416 | 35.3 |
| Lower pulse rate | 274 | 23.2 |
| Lower blood pressure | 227 | 19.2 |
| No contribution | 75 | 6.4 |
| Other | 87 | 7.4 |

** Respondents could select more than one general factor.*

*Analysis and Interpretation.* For purposes of discussion, comparisons will be made between selected general benefits of water exercise (Table 17), and respondent's opinions of contributions made through water exercise, (Table 18), with exception of "all round body conditioning." All round body conditioning, which affects the physical and psychological functioning of individuals, was the general benefit of water exercise reported by a large majority of the respondents (80%).

– Sense of Well Being. Given that the reported weight loss or, lower pulse rate, and/or lower blood pressure are subsumed within the category, "sense of well being," these factors, when present, contribute to the individuals' sense of well being. By inference, respondents whose purpose in water exercising included "increased sense of well being" (69.5%) and who experienced weight loss (35.3%), or reduced pulse rate (23.2%) and/or blood pressure (19.2%), experienced a match between purpose and outcome of water exercise which tends to reinforce participation by fostering a "satisfying state of affairs."

– Stress Reduction. By common association, the act of relaxing is thought to contribute to reduction of stress. Given the validity of this association, and by inference, respondents whose purpose in water exercising included 'relaxing" (49.8%), and for whom a reported outcome was a reduced stress level (68.6%), would be expected to experience reinforcement for water exercising through the positive interaction between purpose (relaxation) and outcome (stress level reduction.)

– Fun Time. Respondents viewed water exercise as a "fun time" (52.9%), which afforded opportunity to "be with other people" (48.5%). Social interaction with other people in a non-work or play climate, herein called "fun time," permits even adults to escape the realities of daily existence.

– Other Factors. When compared to all other listed general reasons for water exercising, "Improved appearance" received the lowest rating from respondents (35.8%), with exception of "no general benefit" (0.8%). It is hypothesized that among a majority of these participants, the stimulus for water exercise was primarily "keeping fit.," and this may account in part for the relatively low rating for "improved appearance." It also is possible that this survey population, who were people actively engaged in water exercise to condition their bodies, have a stricter self-criticism about appearance than found among the general public, and standards for appearance that are relatively difficult to achieve.

## Data for the Profile of A Typical Water Exercise Workout

Thirteen activities, commonly reported in the literature for inclusion in water exercise workouts, were listed in the survey. From these listed activities, respondents identified activities included in a water workout in the 3 frequency categories of: (1) "Most of the time;" (2) "Some of the time;" and (3) "Rarely/None of the time." The activities identified in the category, "Most of the time," by more than fifty percent of the respondents were: water jogging, 66.9 percent; open water exercises, 63.4 percent; stretching, bending and twisting exercises to warm-up 60.2 percent and cool down 60.5 percent; exercise routines, 60.1 percent; wall exercises, 59.2 percent; and water jumping, 57.6 percent. These data are shown in Table 19.

In the category, *"Some of the time,"* activities with percentages ranging from 50 to 30 percent on the bases of respondent identification, were: flutter kicking, 41.2 percent; water walking, 40.8 percent; wall exercises, 34.5 percent; floating exercises, 33.8 percent; and water jumping, 30.2 percent.

In the category, *"Rarely/None of the time,"* activities which ranged from a high of 83 percent to a low of 20 percent are reported. These activities were: breathing exercises, 83 percent; lap swimming, 73.8 percent; swim/widths, 71.9 percent; floating exercises, 27.3 percent; water walking, 21.9 percent; and, exercise routines, 20.8 percent.

In the category, *"other,"* activities written-in by respondents in the profile section of a typical water exercise workout included lap swimming after the water exercise workout, which was the activity most often added by respondents. Other activities included: bicycling in water; filling plastic bottles with water for weight lifting; playing water volley. A listing of write-in statements is shown in Appendix G.

**Table 19: Profile of a Typical Water Exercise Workout**

| Water Activity | *Frequency Category* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Most | | Sometimes | | Rarely/None | | No Response | |
| | No. | % | No. | % | No. | % | No. | % |
| Water walking | 355 | 30.1 | 482 | 40.8 | 259 | 21.9 | 84 | 7.1 |
| Water jogging/stationary & moving | 790 | 66.9 | 319 | 27.0 | 35 | 3.0 | 36 | 3.1 |
| Water jumping/upward, sideward, forward, backward. At times, jumping & jogging are combined in a series | 680 | 57.6 | 356 | 30.2 | 94 | 8.0 | 50 | 4.3 |
| Flutter kicking/holding pool bracket | 471 | 39.9 | 486 | 41.2 | 187 | 15.8 | 36 | 3.1 |
| Breathing exercises called 'bobbing' (Rhythmic breathing series in the vertical, alternately breathing in at the surface, & dropping under to blow air out) | 53 | 4.5 | 61 | 5.2 | 97 | 83.0 | 87 | 7.4 |
| Wall exercises/ for arms, legs, abdominals & other body parts | 699 | 59.2 | 407 | 34.5 | 52 | 4.4 | 22 | 1.9 |
| Floating exercises/ with or without aid of a flotation device such as flutter board for legs, abdominals and other body parts | 401 | 34.0 | 399 | 33.8 | 334 | 28.3 | 46 | 3.9 |
| Open water exercises/ standing on pool floor, bending & stretching for arms, shoulders, & other body parts | 748 | 63.4 | 335 | 28.4 | 77 | 6.5 | 20 | 1.7 |
| Stretching, bending & twisting exercises - before the water exercise workout to warm-up at pool wall and/or in open water | 710 | 60.2 | 241 | 20.4 | 201 | 17.0 | 28 | 2.4 |
| Stretching, bending & twisting exercises - after the water exercise workout to cool-down at pool wall and/or in open water | 714 | 60.5 | 278 | 23.6 | 160 | 13.6 | 23 | 2.4 |
| Exercise Routines/ a set series of movements in open water often done to recorded music | 709 | 60.1 | 189 | 16.0 | 246 | 20.8 | 36 | 3.1 |
| Swimming / widthway of pool | 206 | 9.0 | 154 | 13.1 | 849 | 71.9 | 971 | 6.0 |
| Lap swimming, lengthway of pool for distance | 117 | 9.9 | 113 | 9.6 | 871 | 73.8 | 79 | 6.7 |
| Other, specify. | 1040 | 88.1 | 38 | 3.1 | 27 | 2.3 | 75 | 6.4 |

## *Analysis and Interpretation: Data for the Profile of a Typical Water Exercise Workout*

Warm-up and Cool-down Practices. A warm-up (60.2%) and cool-down (60.5%) was included in the typical water exercise workout "most of the time". For some respondents, however, the preparatory warm-up (17%), and tapering techniques of the cool down (13.6%) were either excluded or rarely included. Some water exercise teachers need the encouragement and help of appropriate sources if they are to incorporate preparatory and tapering techniques within the water workout.

Breathing Exercises and Widthway or Distance Swimming. Based on the survey data, breathing exercises (83%), widthway swimming (71.9%) and distance swimming (73.8%), are not part of a typical water workout for a majority and beyond of these water exercise participants. Distance or width-way swimming, according to write-in comments by about 22 participants, are elective forms of exercise following the instructional water exercise workout (see Appendix G).

Typical Workout and Shallow Water Exercises. Of the thirteen listed activities, which respondents rated in 3 frequency categories to describe a typical water exercise workout, six are customarily performed in shallow water. These shallow water activities and the percentage for each, for the categories "most of the time," and "some of the time," respectively, were: water walking (30.1% and 40.8%); water jogging/stationary and moving (66.9% and 27%); water jumping (57.6% and 30.2%); open water exercises/ standing on the pool floor (63.4% and 28.4%); and exercise routines/a set series of movements (60.1% and 16%). Stretching, bending and twisting exercises in the periods before and following the main water workout, likewise are best suited to shallow water. Pool location is a common denominator for these activities; that is, they are performed in shallow water.

Activities in Overlapping Frequency Categories Two activities, each of which received approximately equal percentages in the frequency categories of "Most of the time," and "Some of the time," warrant discussion. Respondents reported flutter kicking (39.9%) and (41.2%), and floating exercises, (34% and 33.8%) in the categories of "Most of the time" and "Some of the time," respectively. Review of the data, shown in Table 19, indicated that percentages among frequency categories for all other listed activities differed distinctly in contrast to the approximately equal percentages received for flutter kicking and floating exercises in these two frequency categories. It appears that flutter kicking and floating exercises were included , but not as consistently as water exercises previously reported by fifty percent or more respondents. Factors operating in this instance, may include the instructors' desire to avoid excessive repetition, or sameness, and/or the feasibility of selecting from a wider range of in-water exercises for water exercise workouts, in order to sustain relatively high levels of motivation among their participants.

Typical Workout and Shallow/Deep Water Exercises. Respondents reported wall exercises (59.2% and 34.5%), and flutter kicking/holding the pool wall (39.9% and 41.2%), in the two frequency categories of "Most of the time," and "Some of the time," respectively. These two activities may be performed either in shallow or deep water. The physical support and psychological security afforded by contact with the pool wall, make these exercises feasible and safe for participants whose swimming abilities may range from non-swimmers to swimmers.

Floating exercises, with or without aid of a flotation device, such as a flutter board, to exercise the legs, abdominals and other body parts, also are activities that may be performed either in shallow or deep water. Floating exercises were reported in the frequency categories of "Most of the time,"(34%), and "Some of the time" (33.8%). This fluctuation between frequency categories may be attributed to the swimming abilities of participants in a given water exercise class. To illustrate, physical skill to control a suspended body position in water and psychological adjustment to the sensation of body suspension, called floating exercises, are more common among deep water swimmers than among novice swimmers, even with the aid of a flotation device. Focus upon floating exercises may need to be minimized by the instructor when a number of participants in a given water exercise class are relatively unskilled swimmers.

Typical Workout in Relation to Reported Pool Locations for Water Exercise. Comparison of the data for a typical water exercise workout, with data for pool location of the water exercise workout, indicated that some participants reported exercising only at the side of the pool (15.3%). For other respondents, the water exercise workout was performed only in shallow, open water (26%). The total percentage of respondents (41.3%) who water exercised only at the pool wall or in open, shallow water was related to swimming ability, for these were individuals who needed to restrict their water exercise either to shallow water or use of the pool wall for support.

Generalizations for a Typical Water Workout. In terms of pool space per participant, and generalizing from these survey data for a typical water exercise workout, individuals of varying swimming abilities can be accommodated by the instructor of a water exercise class when wall exercises, or floating exercises, or open water exercises are conducted simultaneously in shallow and deep water. The number of total participants in a water exercise class that can be taught safely and comfortably in a single workout, appears dependent upon factors which include: pool size and water depths; swimming ability of participants and instructors; and, instructional design of the water exercise workout.

## Data for the Profile of Other Leisure Fitness and Sport Activities

This section will report relative numbers of respondents who reported participation in vigorous exercise, and other regular exercise, which was in addition to water exercise. Respondent's self-perception as a physically active person in relation to others in their age group also will be reported.

Other Vigorous Exercise. Vigorous fitness exercise for this section is in two categories: (1) vigorous land exercise and (2) vigorous water exercise. Category 1, vigorous land fitness exercise includes land walking-jogging, cycling, aerobic land exercise and land exercise with equipment. Category 2, for other vigorous fitness exercise, is represented by endurance swimming. Data for this section are shown in Table 20.

For category 1, vigorous land fitness exercise, seven hundred fifty eight or 65.1 percent of the respondents participated in land walking/jogging, and two hundred ninety six, or 25.4 percent of the respondents participated regularly in cycling (bicycling). Aerobic land exercise and fitness exercise with land equipment were checked by two hundred sixty nine or 23.1 percent of the respondents, and one hundred eighty-eight or 16.2 percent of the respondents, respectively.

For category 2, vigorous water fitness exercise activity, only endurance swimming was listed in the survey and so classified. Three hundred fourteen or 27.0 percent of the respondents regularly participated in this vigorous fitness activity.

**TABLE 20. Profile of Leisure Fitness and Sport Activities**

| Leisure Fitness and Sport Activity | Participants |  | No Response |  |
|---|---|---|---|---|
|  | No. | % | No. | % |
| Aerobic Land Exercise (vig. heart/lung exercise) | 269 | 23.1 | 911 | 77.0 |
| Archery | 3 | .3 | 1177 | 99.7 |
| Basketball (or similar team sport) | 32 | 2.7 | 1148 | 97.3 |
| Bowling or Golf | 180 | 15.5 | 1000 | 84.5 |
| Boxing or Wrestling | 1 | .1 | 1179 | 99.9 |
| Cross Country Skiing (for endurance/distance) | 83 | 7.1 | 1097 | 93.0 |
| Cycling/Bicycling (for endurance/distance) | 296 | 25.4 | 884 | 74.6 |
| Dancing | 168 | 14.4 | 1012 | 85.6 |
| Downhill Skiing | 42 | 3.6 | 1138 | 96.4 |
| Horseshoe Pitching | 5 | .4 | 1175 | 99.6 |
| Judo or Karate | 0 | .0 | 1180 | 100.0 |
| Land Walking/Jogging | 758 | 65.1 | 422 | 34.9 |
| Land Exercise w/Equipment | 188 | 16.2 | 992 | 83.8 |
| Racquet Ball (or similar racquet sport) | 53 | 4.6 | 1127 | 95.4 |
| SCUBA Diving | 3 | .3 | 1177 | 99.7 |
| Sailing or Canoeing | 27 | 2.3 | 1153 | 97.7 |
| Shuffleboard | 3 | .3 | 1177 | 99.7 |
| Swimming (for endurance/distance) | 314 | 27.0 | 866 | 73.0 |
| Table Tennis | 15 | 1.3 | 1165 | 98.7 |
| Other, specify | 108 | 9.3 | 1172 | 90.7 |

Other Recreational/Leisure Sport Activities. Respondents also identified "other recreational/leisure sport activities" in which they regularly participated. This regular participation was in addition to regular participation in water exercise and vigorous land or water fitness activities. Six hundred ninety-eight or 59 percent of the respondents participated regularly in "other land and water sports of a recreational/leisure nature."

Land activities, involving "other recreational/leisure sport activities," were placed in category 3, and sub-categorized into activities featuring person-to person contact, person-to-environment conquest, and recreational/leisure sport activities.

In the sub-category, "person-to-person contact," for land activities, less than 5 percent of the respondents participated regularly in judo/karate; boxing/wrestling; racquetball; or basketball.

In the sub-category of "person-to-environment conquest," for land activities, fewer than ten percent of the participants reported participation in downhill skiing, or cross country skiing. These data are shown in Table 20.

In the sub-category, "recreational/leisure sports activities," for land activities, less than 5 percent respondents reported regular participation in archery, shuffleboard, horseshoe pitching, or table tennis. Dance and bowling/golf deviated from this pattern of relative non-participation with slightly increased numbers reporting regular participation. These data are shown in Table 20.

For category 4, "other recreational/ leisure sports activities," and the sub-category for water activities of person-to-environmental combat, only SCUBA diving was listed in the survey and so classified. Fewer than five percent of the participants engaged regularly in SCUBA diving.

*Analysis and Interpretation.* In addition to regular participation in water exercise, respondents reported regular participation in other vigorous fitness exercise. Respondents who reported vigorous land fitness exercise on a regular basis, identified the two activities of cycling, i.e., bicycling (25.4%), and land walking/jogging (65.1%). For regular vigorous water fitness exercise activity, respondents identified endurance swimming (27.1%).

Respondents also reported regular participation in "other recreational/leisure sport activities." In the sub-category of "other land recreational/leisure sport activities," respondents reported regular participation in sports featuring person-to person contact, such as judo/karate (0%), and sports involving person-to-environmental conquest, such as down-hill skiing (3.6%), and cross country skiing (7.1%). The data for regular participation in recreational/leisure sports activities which involve personal contact or environmental conquest, indicated that such activities lacked attractiveness for these participants. Downhill and cross country skiing, which are forms of environmental conquest, are somewhat dependent upon environmental opportunity. This environmental factor or inaccessibility to snow and/or suitable terrain, may account for the report of relatively low participation among these respondents. For "other land recreational/leisure activities" a dearth of respondents reported regular participation in archery (.3%), shuffleboard (3%), horseshoe pitching, (.4%) or table, tennis (1.3%). Within this same category for land activities, only dance (14.4%) and bowling/golf (15.5%), deviated from this pattern of relative non-participation.

In the sub-category of "other water recreational/leisure sport activites, involving person-to-environment conquest," few participants engaged regularly in SCUBA diving (.3%). A limited number of participants reported regular participation in other water recreational/leisure sport activities of sailing/canoeing (2.3%). For some participants, lack of a suitable environment to sail or canoe may have restricted participation in these water sports.

Frequency of Participation in Leisure and Sport Activities. Respondents identified other leisure fitness and sport activities in which they regularly participated from a listing of about eighteen activities, and the number of days of participation weekly for each of these activities. Leisure fitness and sport activities that were reported by fourteen percent or more of the respondents, together with the patterns of weekly participation per activity are presented in Table 21.

**TABLE 21. Other Leisure Fitness and Sport Activities of Participants, Reported by Frequency of Weekly Participation**

| | Participants | | Days Per Week | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Leisure Fitness & | | | 1 | | 2 | | 3 | | 4 | |
| Sport Activities | No. | % | No. | % | No. | % | No. | % | No. | % |
| Land Aerobic Exercise | 270 | 22.9 | 50 | 4.2 | 113 | 9.6 | 66 | 5.6 | 41 | 3.5 |
| Land Walking/Jogging | 765 | 64.8 | 169 | 14.3 | 244 | 20.7 | 148 | 12.5 | 204 | 17.3 |
| Swimming | 315 | 26.7 | 81 | 6.9 | 118 | 10.0 | 63 | 5.3 | 53 | 4.5 |
| Cycling/Bicycling | 297 | 25.2 | 118 | 10.0 | 91 | 7.7 | 42 | 3.6 | 46 | 3.9 |
| Land Exercise w/Equip | 188 | 15.9 | 51 | 4.3 | 59 | 5.0 | 47 | 4.0 | 31 | 2.6 |
| Bowling orGolf | 182 | 15.3 | 109 | 9.2 | 52 | 4.4 | 17 | 1.4 | 4 | .3 |
| Dancing | 169 | 14.3 | 128 | 10.89 | 26 | 2.2 | 9 | .8 | 6 | .5 |

The five vigorous fitness activities reported by fourteen percent or more of the respondents were: aerobic land exercise, by two hundred seventy or 22.9 percent; land walking/ jogging, by seven hundred sixty-five or 64.8 percent; swimming for endurance/distance, by three hundred fifeen or 26 percent; cycling/bicycling for endurance/distance, by two hundred ninety-seven or 25.2 percent; and land exercise with equipment, by one hundred eighty-eight or 15.9 percent.

One day of participation weekly was the dominant pattern for aerobic land exercise, and the endurance/distance acitivity of cycling/bicycling. For endurance/ distance swimming, the dominant participation pattern was two days weekly. For land walking/jogging, and land exericse with equipment, participation ranged from one to 4 or more days weekly, with no single pattern predominating.

Two or 3 leisure sport activities also were identified for regular participation by fourteen percent or more of the respondents. Participation one day weekly was the dominant pattern for bowling or golf, for one hundred eighty-two or 15.4 percent; and dancing, for one hundred sixty-nine or 24.3 percent of these respondents.

Fourteen percent and beyond of the participants regularly engaged in selected other leisure fitness activities and sport activities, in addition to regular participation in water exercise.

*Analysis and Interpretation*. These data supported the conclusion that in addition to regular participation in water exercise, the population surveyed was most attracted to and tended to participate in other vigorous fitness type land activities and the water activity of swimming, to the relative exclusion of other recreational leisure sport activities. The range of vigorous physical activities identified by respondents, and frequency of participation in one or more of these vigorous physical activities on a weekly basis, indicated that these were individuals who sought out a "variety of fitness type involvements."

Of the 1180 respondents, 75.2 percent believed that he/she could be described as a 'physically active person' in relation to others in their age group. One hundred thirty-three or 11.3 percent, and one hundred fifty-four or 13.1 percent checked "no" or "not sure", respectively, in response to this question.

## Comparison of Age Categories With Water Exercise Benefits

In the statement of the problem of this study, the researchers proposed to investigate similarities and differences between various demographic groups on attitudes and participation patterns in water and related activities. An interesting comparison can be made between the age of the respondent and the reasons for and perceived health benefits from participation in water exercise (activities). For this survey, ages of the respondents were grouped into one of four categories: (1) less than 20 years of age; (2) twenty to 39 years of age; (3) forty to 59 years of age; and, (4) sixty or more years of age. When the comparison of age is made with cardiorespiratory endurance, muscular endurance, flexibility, muscular strength, all-round toning and firming and taking inches off, a significant relationship is found between age and cardiorespiratory endurance, age and flexibility; age and all-around body toning and fimring, and age and taking off inches. The Chi Square values between the categories of age and whether the response was "yes" or "no" to each of the health reasons are presented in Table 22.

**TABLE 22. Comparison Between Age and Perceived Health Benefits**

| Benefit | Chi Square Value | Significance |
|---|---|---|
| Cardiorespiratory endurance | 16.92 | .0007 |
| Muscular endurance | 3.80 | .2800 |
| Flexibility | 63.86 | .0000 |
| Muscular strength | 3.68 | .2986 |
| All around body toning and firming | 20.21 | .0002 |
| Taking off inches | 34.24 | .0000 |

*Chi Square significance values were computed with 3 degrees of freedom.*

It is interesting to note that muscular endurance and muscular strength were not significantly related to age as reasons for participation in water exercise, but that cardiorespiratory endurance, flexibility, body toning and 'removing inches' were related. In the case of cardiorespiratory endurance, sigificantly more than the expected number cited this reason in the 40-59 age group, but significantly less than the expected number in the above 60 age group cited this as a reason. For flexibility, less than the expected number in the lower age groups (below 20 and between 20 and 39 yrs), cited this as a reason, but in the higher age groups, more than expected cited flexibility as a reason for participation. For body toning and conditioning, less than the expected number of respondents below 20 or above 60 years gave this as a reason, but more than the expected number of respondents in the middle age categories (20-39 and 40-59) cited body toning and conditioning as a reason for water exercise participation. This same pattern holds for "taking off inches" as a major reason for participation.

Another interesting comparison is between the major benefits the respondents believed they experienced from water exercise and the age categories.The benefits cited on the survey were improved appearance, increased sense of well being, fun time being with other people, relaxing, and all around body conditioning. Table 23 indicates possible relationships between age and these variables.

**TABLE 23. Comparison Between Age and Major Benefits**

| Benefit | Chi Square Value | Significance |
|---|---|---|
| Improved appearance | 22.42 | .0001 |
| Increased well being | 25.63 | .0000 |
| Fun time | 28.59 | .0000 |
| Being with others | 17.41 | .0006 |
| Relaxing | 6.85 | .0767 |
| Body conditioning | .56 | .9054 |

*Chi Square significance values were computed with 3 degrees of freedom.*

It is interesting that more than the expected number of respondents in the 20-39 age category and 40-59 age category cited improved appearance as a major benefit, while less than the number expected in the youngest and oldest category cite improved appearance as a well-being as a major reason was the 40-59 category. Much more than the expected number of respondents cited well-being as a major benefit.

The social benefits of fun time, being with others, and relaxing showed different patterns. More than the expected number of respondents in the 20-39 age category cited "fun time" as a major benefit of water exercise, while, in other age categories, less than the number expected suggested that fun time was a benefit. On the other hand, the significant Chi Square value for the benefit, "being with others," produced more than the expected number citing this benefit in the above 60 age category and less than the expected responses in the other age categories. While one may argue that "relaxing" may not have been noted as a significant benefit, the middle age categories cited relaxing as a major benefit more than what was expected, while the youngest and oldest age categoreis cited it as a major benefit fewer times than expected

Interesting comparisons can be made between age level and the factors of weight loss, lower pulse rate, lower blood pressure and reduced stress level. Of the 1164 respondents to these items, 1091 or 93.7% indicated that water exercise made a contribution to one or more of these factors. These data are shown in Table 24.

**TABLE 24. Comparison Between Age and Health Related Factors**

| Benefit | Chi Square Value | Significance |
|---|---|---|
| Weight loss | 32.89 | .0000 |
| Lower pulse rate | 29.96 | .0000 |
| Lower blood pressure | 41.20 | .0000 |
| Reduced stress level | 8.92 | .0304 |

*Chi Square significance values were computed with 3 degrees of freedom.*

It is interesting to note that the age group that did not cite water exercise as a contributor to weight loss as much as the other age groups was the over 60 age group. This age group also did not cite lower pulse rate as a benefit of water exercise as did the other age groups. However, the over 60 age group had more respondents than expected in claiming that water exercise contributed to lower blood pressure, while the reverse was true in the other age categories. The significant Chi Square obtained for reduced stress level was caused by more respondents than expected citing this factor as a benefit of water exercise, while less than the expected frequency was obtained for the other age groups.

Certain physical fitness elements are expected to improve through water exercise. Four important elements are cardiorespiratory endurance, muscular endurance, flexibility and muscular strength. Of the 1164 who responded, only 39 claimed that none of these elements had improved. Eleven hundred twenty-five of the sample, or 96.6% did note improvement in at least one of these fitness factors. An analysis by age classification produced the result shown in Table 25.

**TABLE 25. Comparison Between Age and Fitness Factors**

| Benefit | Chi Square Value | Significance |
|---|---|---|
| Improved cardiorespiratory endurance | 42.82 | .0000 |
| Improved muscle endurance | 8.79 | .0321 |
| Improved flexibility | 95.38 | .0000 |
| Improved muscle strength | 6.18 | .1030 |

*Chi Square significance values were computed with 3 degrees of freedom.*

Except for muscle strength, the surveyed elements of physical fitness differed significantly with age group. In the case of improved cardiorespiratory endurance, the above 60 category responded differently than the other groups, with less than the expected number reporting this element as an improvement. For the element, "improved muscle endurance," the 20-39 group had more responses that this was an important benefit of water exercise, while the under 20 and above 60 groups had less response than expected. The lower age categories had less than the expected number report improvement in flexibility as a benefit of water exercise, while the 40-59 group and the above 60 group had more response than expected.

Participation in other leisure fitness and sport activities of the respondents to the questionnaire is interesting. Respondents were asked how many times per week they participated in the different activities. When the results were tabulated, it was found that the most meaningful tabulation was whether they participated at all during a normal week in these activities. The activity, the number participating in a normal week, and the percent participating are shown in Table 26.

**TABLE 26. Comparison of Leisure Fitness and Sport Activities with Number and Percent Participating**

| Activity | Number Participating | Percent Participating |
|---|---|---|
| Aerobic land exercise (Vig. heart/lung ex) | 269 | 23.1 |
| Archery | 3 | .3 |
| Basketball | 32 | 2.7 |
| Bowling or golf | 180 | 15.5 |
| Boxing or wrestling | 1 | .1 |
| Cross country skiing | 83 | 7.1 |
| Cycling | 296 | 25.4 |
| Dancing | 168 | 14.4 |
| Downhill skiing | 42 | 3.6 |
| Horseshoes | 5 | .4 |
| Judo | 0 | .0 |
| Land walking/jogging | 758 | 65.1 |
| Land exercise with equipment | 188 | 16.2 |
| Racquet ball | 53 | 4.6 |
| SCUBA diving | 3 | .3 |
| Sailing | 27 | 2.3 |
| Shuffleboard | 3 | .3 |
| Swimming (endurance-distance) | 314 | 27.0 |
| Table tennis | 15 | 1.3 |
| Other activities | 108 | 9.3 |

As can be observed from Table 27 the activities where more than 10% of the respondents indicated weekly participation included: aerobic land exercise, bowling or golf, cycling, land walking or jogging, land exercise with equipment, and swimming for endurance or distance. Comparison of the activities in which 10% or more of the respondents participated with the four age categories produced the following results shown in Table 27.

**TABLE 27. Comparison of Activities with Age Categories**

| Activity | Chi Square Value | Significance |
|---|---|---|
| Aerobic land exercise | 65.97 | .0000 |
| Bowling/golf | 2.9 | .5541 |
| Cycling | 49.58 | .0000 |
| Dancing | 94.16 | .0000 |
| Land walking/jogging | 8.88 | .0309 |
| Land exercise | 64.16 | .0000 |
| Swimming (for endurance/distance) | 76.92 | .0000 |

*Chi Square significance values were computed with 3 degrees of freedom.*

With the exception of bowling or golf which showed no difference in participation by age category, the other activities all had the same pattern. In the under 20 category and the 20-39 category, more respondents participated than were expected by the calculated expected value, while the 40-59 category and the over 60 category had less respondents participating at least once weekly than the calculated expected value. The sample thus suggests that water exercise may well be the most important physical activity for older age categories.

# CHAPTER V

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The primary purpose of this study was to gather information about water exercise participants. Data collected included demographics of participants; typical water exercise workouts and associated practices; medical clearance for water exercise and physical conditions or problems of respondents; subjects' reasons for participation, frequency of participation, and average number of participation days per week; and other leisure time fitness and sport activities to investigate frequency of participation, and average number of participation days per week to cover about 18 different activities.

The research was conducted during the Spring term of 1988 at Ball State University. Each of the one hundred thirty-seven water exercise teachers who were involved in this study distributed ten survey instruments* to water exercise participants, who were selected randomly. Of the total of 1370 surveys distributed, 1180 or approximately 86 percent were returned by the respondents and tabulated for statistical analysis. Nine surveys were returned after the tabulation process was completed and were deleted from the study.

Conclusions and recommendations for future study of water exercise will be presented in the following section.

### Conclusions

On the basis the this survey research, and within the limitations of this investigation, analysis of the data suggests that:

1. Different benefits are derived from water exercise for different age groups, and that improved endurance, both muscular and cardiorespiratory are more important than muscular strength and improved appearance. The data also suggests that for older age groups, water exercise may well be the most important physical activity.
2. The stimulus for in-water exercising among this survey population was "keeping fit" through all-round body conditioning, which was often accompanied by an increased sense of wellness, relaxation and social interaction.
3. Some water exercise instructors need assistance in the instructional design of the water workout to incorporate exercises for warm-up and cool-down of participants, and planning of the main exercise workout for consistent and regular inclusion of vigorous water exercises, in addition to water exercises that are low in intensity.
4. Among some water exercise instructors, there is need to offer training in field tests (non-laboratory tests) which measure exercise intensity and procedures which encourage consistent and regular use by water exercise participants of techniques to monitor heart rate response and individual feelings of effort when water exercising.

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** Requests by 3 teachers were honored for fewer or more than 10 survey instruments stipulated for mailing by the researchers. Total number of surveys distributed remained unchanged.*

5. For some water exercise teachers, instruction is needed in methods of calculating target heart rate and design of instructional approaches which encourage the use and retention of selected techniques among water exercise particpants, in order to adjust exercise intensity over time for achievement of desirable training effects.
6. Given research evidence of the viability of breathing exercises for recovery of participants between vigorous water exercises, instructional focus may be needed for inclusion within the exercise workout of breathing exercises, often called "bobbing."
7. Guidelines for teachers of water exercise which focus on the desirability of medical or in-house health clearance of participants prior to participation in water exercise, and procedures for establishing working relationships with medical supervisors appear to be needed.

## Recommendations for Further Research of Water Exercise

*On the basis of the investigators' experience with the present research, recommendations for further research of water exercise are proposed which follow.*

### National

Study of nationally recognized fitness and aquatic organizations/agencies, to determine work underway or projected to promote physical fitness for the public through water exercise.

### Participants

Study of:

1. water exercise programs designed primarily for older populations and physical/mental rehabilitation of individuals.
2. the psychological and/or physiological factors that may impel certain individuals to water exercise in a regular and sustained fashion, sometimes called "water exercise addiction," and of these individuals.
3. attitudes, values and lifestyles of water exercise participants in relation to personal appearance, and other motivational factors which appear to underly water exercise.
4. public relations techniques which may be employed to increase involvement among the male population in water exercise as participants and teachers.

### Teachers

Study of:

1. nationally recognized organizations and individual entrepreneurs who conduct in-service training for water exercise teachers, and /or award land and water fitness certification(s), to include process and standards.
2. water exercise teachers to gather information about their swimming ability, current nationally recognized certifications in lifeguarding, first aid, cardiorespiratory resuscitation, and teaching of aquatic activities, and specific preparation to teach water exercise.
3. physical fitness certifications currently held by water exercise teachers.
4. water exercise teachers in the field to investigate innovative approaches, and problems or concerns of teachers in relation to water exercise.

### Programs

Study of:

1. policies and procedures established by pool management and/or the individual water exercise teacher for conduct of water exercise programs and classes.
2. pools used for water exercise throughout the United States, to gather information about typical pool dimensions and water depths; deck space; sound equipment including underwater sound; lighting, including underwater lighting; and dressing room facilities; and safety supplies and equipment.

### Equipment and Supplies

Study of:

1. recognized safety standards and physical fitness benefits in relation to equipment and supplies used to water exercise.
2. equipment and supplies currently marketed, or needed, for and by the water exercise consumer.

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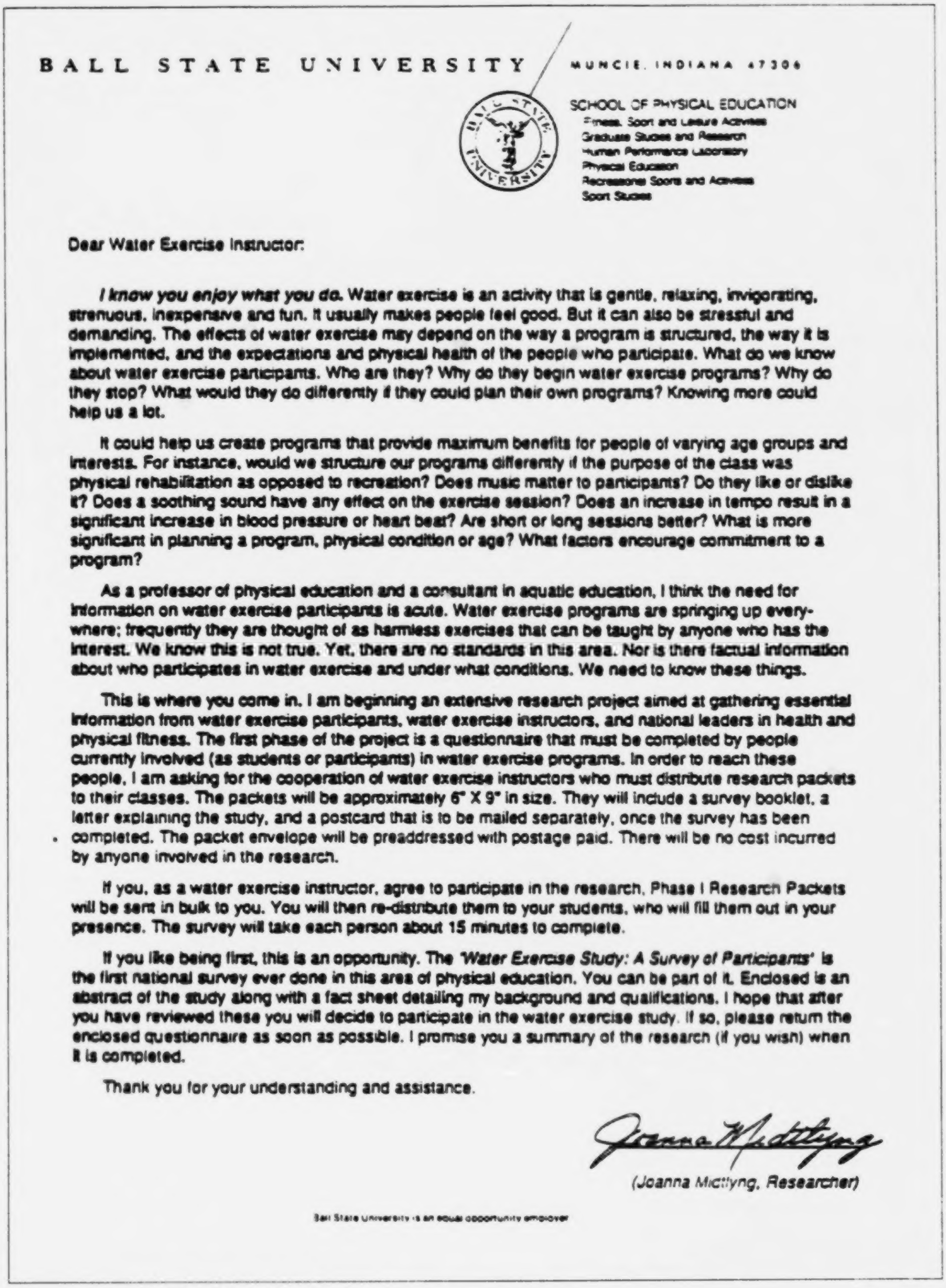
# APPENDIX A

- Resarcher's Letter of Invitation to Water Exercise Teachers
- Water Exercise Teacher Questionaire
- Instruction Sheet for Random Selection of Subjects
- The Survey Instrument and Post Card Enclosure

## (Appendix A): Researcher's Letter of Invitation to Water Exercise Teachers



BALL STATE UNIVERSITY
MUNCIE, INDIANA 47306

SCHOOL OF PHYSICAL EDUCATION
Fitness, Sport and Leisure Activities
Graduate Studies and Research
Human Performance Laboratory
Physical Education
Recreational Sports and Activities
Sport Studies

Dear Water Exercise Instructor:

***I know you enjoy what you do.*** Water exercise is an activity that is gentle, relaxing, invigorating, strenuous, inexpensive and fun. It usually makes people feel good. But it can also be stressful and demanding. The effects of water exercise may depend on the way a program is structured, the way it is implemented, and the expectations and physical health of the people who participate. What do we know about water exercise participants. Who are they? Why do they begin water exercise programs? Why do they stop? What would they do differently if they could plan their own programs? Knowing more could help us a lot.

It could help us create programs that provide maximum benefits for people of varying age groups and interests. For instance, would we structure our programs differently if the purpose of the class was physical rehabilitation as opposed to recreation? Does music matter to participants? Do they like or dislike it? Does a soothing sound have any effect on the exercise session? Does an increase in tempo result in a significant increase in blood pressure or heart beat? Are short or long sessions better? What is more significant in planning a program, physical condition or age? What factors encourage commitment to a program?

As a professor of physical education and a consultant in aquatic education, I think the need for information on water exercise participants is acute. Water exercise programs are springing up everywhere; frequently they are thought of as harmless exercises that can be taught by anyone who has the interest. We know this is not true. Yet, there are no standards in this area. Nor is there factual information about who participates in water exercise and under what conditions. We need to know these things.

This is where you come in. I am beginning an extensive research project aimed at gathering essential information from water exercise participants, water exercise instructors, and national leaders in health and physical fitness. The first phase of the project is a questionnaire that must be completed by people currently involved (as students or participants) in water exercise programs. In order to reach these people, I am asking for the cooperation of water exercise instructors who must distribute research packets to their classes. The packets will be approximately 6" X 9" in size. They will include a survey booklet, a letter explaining the study, and a postcard that is to be mailed separately, once the survey has been completed. The packet envelope will be preaddressed with postage paid. There will be no cost incurred by anyone involved in the research.

If you, as a water exercise instructor, agree to participate in the research, Phase I Research Packets will be sent in bulk to you. You will then re-distribute them to your students, who will fill them out in your presence. The survey will take each person about 15 minutes to complete.

If you like being first, this is an opportunity. The *'Water Exercise Study: A Survey of Participants'* is the first national survey ever done in this area of physical education. You can be part of it. Enclosed is an abstract of the study along with a fact sheet detailing my background and qualifications. I hope that after you have reviewed these you will decide to participate in the water exercise study. If so, please return the enclosed questionnaire as soon as possible. I promise you a summary of the research (if you wish) when it is completed.

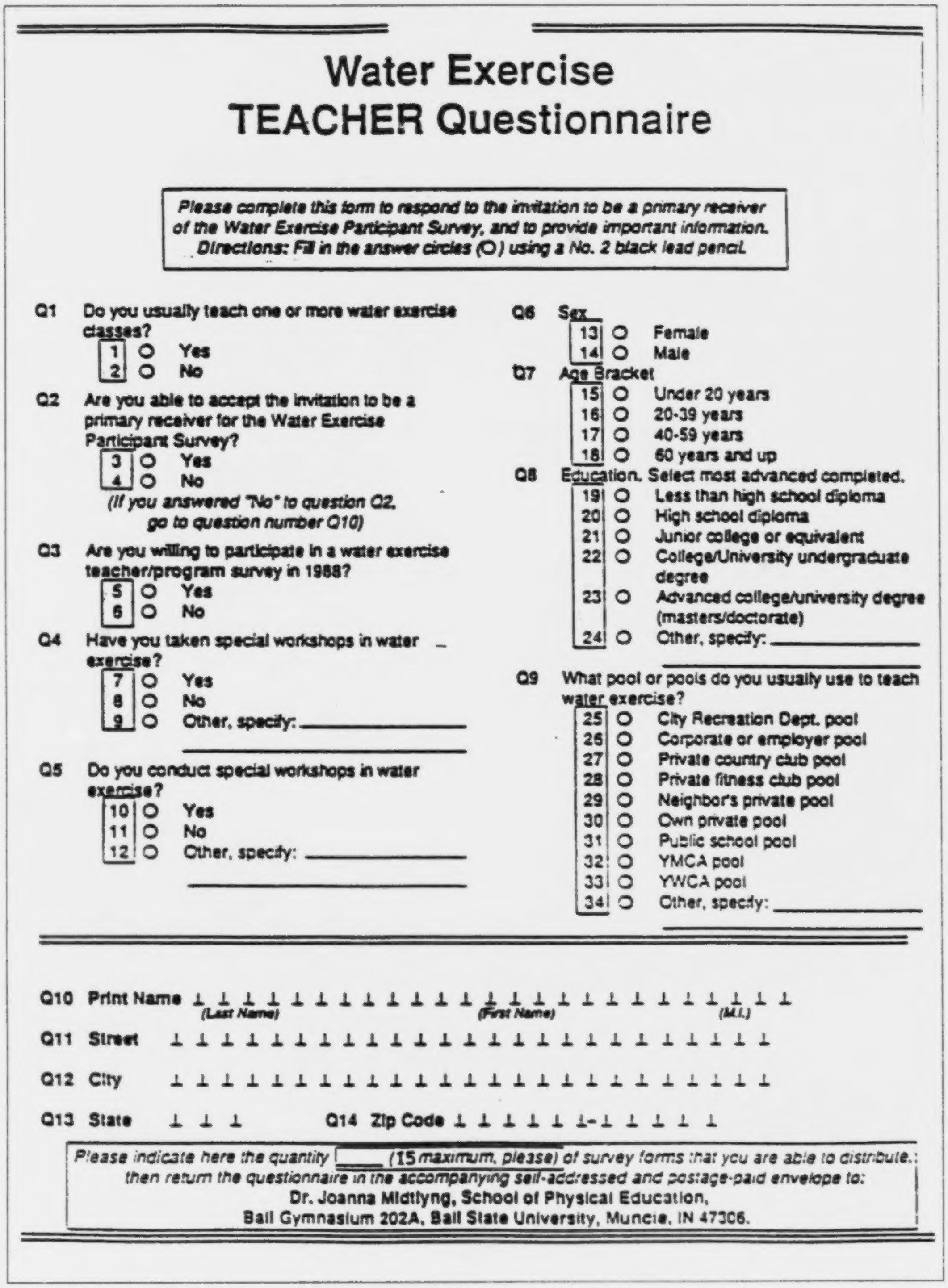
Thank you for your understanding and assistance.

Joanna Midtlyng

*(Joanna Midtlyng, Researcher)*

Ball State University is an equal opportunity employer

## (Appendix A): Water Exercise Teacher Questionnaire



# Water Exercise
# TEACHER Questionnaire

*Please complete this form to respond to the invitation to be a primary receiver of the Water Exercise Participant Survey, and to provide important information.*
***Directions:** Fill in the answer circles (○) using a No. 2 black lead pencil.*

**Q1** Do you usually teach one or more water exercise classes?
1 ○ Yes
2 ○ No

**Q2** Are you able to accept the invitation to be a primary receiver for the Water Exercise Participant Survey?
3 ○ Yes
4 ○ No
*(If you answered "No" to question Q2, go to question number Q10)*

**Q3** Are you willing to participate in a water exercise teacher/program survey in 1988?
5 ○ Yes
6 ○ No

**Q4** Have you taken special workshops in water exercise?
7 ○ Yes
8 ○ No
9 ○ Other, specify: ______________

**Q5** Do you conduct special workshops in water exercise?
10 ○ Yes
11 ○ No
12 ○ Other, specify: ______________

**Q6** Sex
13 ○ Female
14 ○ Male

**Q7** Age Bracket
15 ○ Under 20 years
16 ○ 20-39 years
17 ○ 40-59 years
18 ○ 60 years and up

**Q8** Education. Select most advanced completed.
19 ○ Less than high school diploma
20 ○ High school diploma
21 ○ Junior college or equivalent
22 ○ College/University undergraduate degree
23 ○ Advanced college/university degree (masters/doctorate)
24 ○ Other, specify: ______________

**Q9** What pool or pools do you usually use to teach water exercise?
25 ○ City Recreation Dept. pool
26 ○ Corporate or employer pool
27 ○ Private country club pool
28 ○ Private fitness club pool
29 ○ Neighbor's private pool
30 ○ Own private pool
31 ○ Public school pool
32 ○ YMCA pool
33 ○ YWCA pool
34 ○ Other, specify: ______________

**Q10** **Print Name** ______________ *(Last Name)* ______________ *(First Name)* ____ *(M.I.)*

**Q11** **Street** ______________

**Q12** **City** ______________

**Q13** **State** ______ **Q14** **Zip Code** ______-______

*Please indicate here the quantity _____ (15 maximum, please) of survey forms that you are able to distribute.; then return the questionnaire in the accompanying self-addressed and postage-paid envelope to:*
**Dr. Joanna Midtlyng, School of Physical Education,**
**Ball Gymnasium 202A, Ball State University, Muncie, IN 47306.**

(Appendix A): Instruction Sheet for Random Selection of Subjects

## WATER EXERCISE TEACHER DIRECTIONS FOR SUBJECT SELECTION

*Please note the two requests that follow:*

1. Be sure to review the information below before you select individuals to complete the surveys. It is essential that you follow the process explained below if we are to have a valid and reliable research outcomes; and
2. When you distribute the survey, please announce that any black lead pencil may be used to respond to the survey questions. The pencil does not need to be a No. 2 black lead pencil, as incorrectly stated in the "instruction section" of the survey instrument.

Thank you for your cooperation and understanding!

For this study, a random sample of 10 from your students is requested. If you have 10 or fewer students, then ask each student to fill out a survey.

If you have more than 10 students, take a list of your students (not necessarily alphabetized) and number the list. Using the list of random numbers supplied, go across the list row by row until you find a number that corresponds to a number on your student list. This student receives a survey. Select the next fourteen students in the same manner. If a student selected is unavailable, select a replacement in the same way. The example below illustrates the procedure to use.

***CLASS LIST***

1. Jane C.
2. Bob M.
3. Sally K.
4. Triadaq L.
5. Gertrude A.
6. Mary L.
7. JR. E.
8. Clifford B.
9. Marilee S
10. Jenna W.
11. Pamela E.
12. Ellen E.
13. Ray K.
14. Donna K.
15. Clayton F.
16. Richard N.
17. Ronald R.
18. Jimmy C.
19. Rosalyn C.
20. Gerald F.
21. Betty F.
22. Amy C.
23. Pat N.
24. Frank R.
25. Warren H.
26. Herbert H.
27. Oliver N.
28. Doublas G.
29. Robert B.
30. Casper W.
31. Edwin M.

***Suppose the first and second row of your tables read as follows:***

113 187 77 36 79 76 105 10 17 28 161 158 119 129 154 198
191 103 110 61 41 186 16 24 7 118 47 3 136 155 62

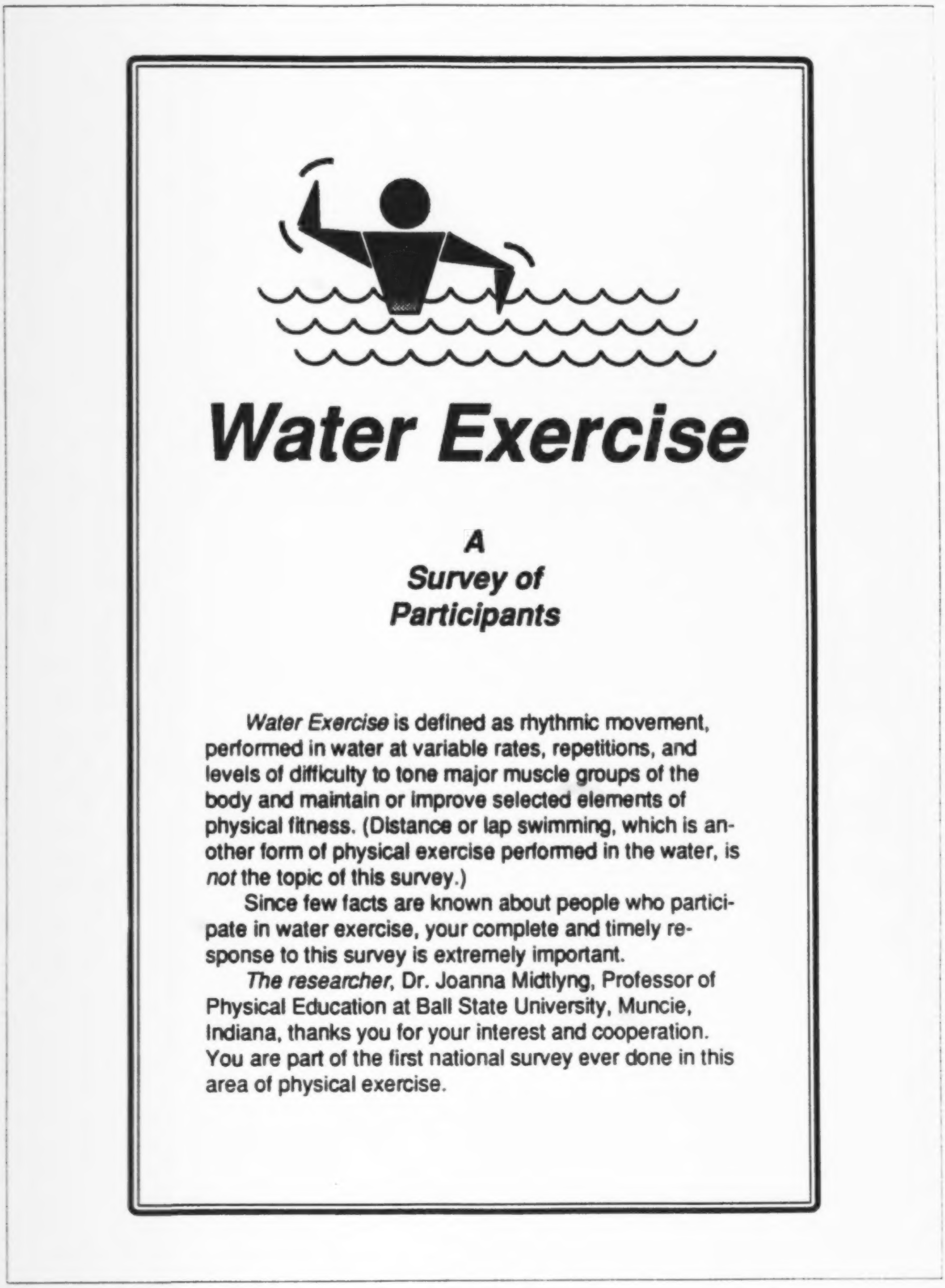
***Then...***

The first student chosen for the survey would be student 10: Jenna W. The second student would be 17: Ronald R. The third student would be 28: Doublas G. The fourth student would be 16: Richard N. The next student would be 7: JR. E.

One could continue in this manner until 10 students are chosen from a class of 31.

Using the table insures randomness in your selection.

(Appendix A): Research Instrument outside front cover



# Water Exercise

## A
## Survey of
## Participants

*Water Exercise* is defined as rhythmic movement, performed in water at variable rates, repetitions, and levels of difficulty to tone major muscle groups of the body and maintain or improve selected elements of physical fitness. (Distance or lap swimming, which is another form of physical exercise performed in the water, is *not* the topic of this survey.)

Since few facts are known about people who participate in water exercise, your complete and timely response to this survey is extremely important.

*The researcher*, Dr. Joanna Midtlyng, Professor of Physical Education at Ball State University, Muncie, Indiana, thanks you for your interest and cooperation. You are part of the first national survey ever done in this area of physical exercise.

(Appendix A): Research Instrument inside front cover

# Instructions

Welcome to the world of water exercise. Completing this computerized survey will take about fifteen minutes of your time. It is not necessary to sign your name to this form. Please read the following instructions, then procede to fill out the survey.

1. Use a No. 2 black lead pencil.
2. Fill in the answer circles completely. Try to keep all marks within the circles. Do not make extra marks on any page.
3. Do not use checkmarks or "X's".
4. Some questions require a "yes" or "no" answer. Please mark one or the other.
5. Some questions require multiple answers. Please be as complete and as accurate as you can. Do not skip a question.
6. Carefully erase any answer you wish to change.
7. Please do not fold, tear, or staple this form.

## *Sample Marks*

***Correct***

● ○ ○
○ ○ ●
○ ● ○

***Wrong***

○ ○ ✔
✖ ○ ○
✖ ○ ○

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## (Appendix A): Research Instrument Page 1

# Section I
## Water Exercise

*If you DO NOT water exercise regularly, a MINIMUM of once WEEKLY, please do not fill out this survey.*

**Q1** For how long have you done water exercise a minimum of once weekly?

1 ○ Less than 1 year
2 ○ 1-2 years
3 ○ 3-4 years
4 ○ 5 or more years
5 ○ Do not water exercise regularly

**Q2** What number of days a week do you usually water exercise?

6 ○ Less than 3 days
7 ○ 3-4 days
8 ○ 5 or more days
9 ○ Too varied to respond

**Q3** How many minutes do you usually participate in each water exercise session?

10 ○ Less than 15 minutes
11 ○ 15-25 minutes
12 ○ 25-40 minutes
13 ○ More than 40 minutes
14 ○ Too varied to respond

**Q4** Who instructs your water exercise?

15 ○ Informally by group members
16 ○ Fomally by one teacher
17 ○ Formally by team teachers
18 ○ Self-instructed
19 ○ Not instructed

**Q5** What pool do you usually use to water exercise?

20 ○ City Recreation Department pool
21 ○ College/university pool
22 ○ Corporate or employer pool
23 ○ Country club pool
24 ○ Fitness club pool
25 ○ Instructor's private pool
26 ○ Own or neighbor's private pool
27 ○ Public school pool
28 ○ YMCA pool
29 ○ YWCA pool
30 ○ Other, specify: ______________________________

______________________________

(Appendix A): Research Instrument Page 2

**Q6** Did you have a doctor's clearance to start water exercise?
31 ○ Yes
32 ○ No

**Q7** What is your swimming ability?
33 ○ Non-swimmer
34 ○ Novice/limited to shallow water
35 ○ Swimmer/deep water
36 ○ Competitive swimming background
37 ○ Other, specify: ______________________________
______________________________

**Q8** What flotation devices or other supplies do you use?
38 ○ Flutter boards
39 ○ Plastic bottles
40 ○ Flexible nylon gloves
41 ○ Hand/wrist weights
42 ○ Ankle weights
43 ○ None of the above
44 ○ Other, specify: ______________________________

**Q9** Which fitness element is emphasized in your water exercise?
45 ○ Cardiorespiratory endurance (heart/lung exercise) as water jogging or other vigorous, repetitive activity and breathing exercise
46 ○ Muscular endurance as flutter kicking with no rest between repetitions
47 ○ Flexibility as bending, stretching and twisting
48 ○ Muscular strength as jumping (legs), push-ups (arms/shoulders) in a series
49 ○ No single emphasis
50 ○ Other, specify: ______________________________
______________________________

**Q10** How do you estimate how hard you are working during your water exercise session?
51 ○ Increases in breathing rate
52 ○ Pulse rate is taken during exercise
53 ○ Perceived level, or best guess
54 ○ Do not estimate

**Q11** In what locations do you usually do your warm-up?
55 ○ Pool deck
56 ○ Shallow water
57 ○ Deep water
58 ○ Both shallow and deep water
59 ○ Combination of locations
60 ○ Seldom or no Warm-up

(Appendix A): Research Instrument Page 3

## Section I

*(Continued)*

**Q12.** In what locations do you usually water exercise?

61 ○ Side of pool
62 ○ Open water/shallow water only
63 ○ Open water/both shallow and deep water
64 ○ Combination of locations

**Q13** How often do you take your pulse in a single session to check how hard you are water exercising?

65 ○ 3 or more times
66 ○ 1-2 times
67 ○ Seldom or never

**Q14** What are your major reasons for exercising in the water?

68 ○ Cardiorespiratory endurance
69 ○ Muscular endurance
70 ○ Flexibility
71 ○ Muscular strength
72 ○ All-round body toning and firming
73 ○ Taking inches off
74 ○ Other, specify: ____________________
____________________

**Q15** Do you currently have any of the physical conditions or problems shown below?

75 ○ Recent surgery
76 ○ Recent illness
77 ○ Obesity
78 ○ Pregnancy
79 ○ Arthritis
80 ○ Heart disease
81 ○ High blood pressure
82 ○ Difficulty with water exercise
83 ○ None of the above
84 ○ Other, specify: ____________________

**Q16** What difficulty have you experienced with water exercise?

85 ○ Chest discomfort
86 ○ Extreme breathlessness
87 ○ Dizzy spells
88 ○ No difficulty experienced
89 ○ Other, specify: ____________________

**Q17** Is your water execise workout usually accompanied by taped or recorded music?

90 ○ Yes
91 ○ Occasionally
92 ○ Seldom or never

## (Appendix A): Research Instrument Page 4

**Q18.** What time of day do you usually water exercise?
93 ○ Morning hours (7 a.m. to noon)
94 ○ Afternoon hours (noon to 5 p.m.)
95 ○ Early evening hours (5 p.m. to 9 p.m.)
96 ○ Late evening hours (after 9 p.m.)
97 ○ Too varied to respond

**Q19** Between repeated periods of hard, vigorous water exercise, do you use less vigorous or breathing exercises to recover?
98 ○ Yes
99 ○ No
100 ○ Water workouts are seldom or never vigorous

**Q20** In general, what major benefits have you experienced from water exercise?
101 ○ Improved appearance
102 ○ Increased sense of well being
103 ○ Fun time
104 ○ Being with other people
105 ○ Relaxing
106 ○ All round body conditioning
107 ○ No general major benefit
108 ○ Other, specify: ________________

**Q21** Have you improved one or more physical fitness elements through your water exercise?
109 ○ Cardiorespitory endurance
110 ○ Muscular endurance
111 ○ Flexibility
112 ○ Muscular strength
113 ○ None are improved

**Q22** In your opinion has water exercise contributed to one or more of the following factors?
114 ○ Weight loss
115 ○ Lower pulse rate
116 ○ Lower blood pressure
117 ○ Reduced stress level
118 ○ No contribution
119 ○ Other, specify: ________________

**Q23** Would you describe yourself as a physically active person in relation to others in your age group?
120 ○ Yes
121 ○ No
122 ○ Not sure

# Section II

## Profile of a typical water exercise workout

**Q24** Fill in the answer circles (○) to show **how often** you do the activities shown below in a typical water exercise session.

M= *Most of the time*
S=*Some of the time*
R= *Rarely none of the time*

|  | **M** | **S** | **R** |  |
|---|---|---|---|---|
| 123 | ○ | ○ | ○ | Water walking |
| 124 | ○ | ○ | ○ | Water jogging/stationary and moving |
| 125 | ○ | ○ | ○ | Water jumping/upward, sideward, and forward and backward jumping. At times, jumping and jogging are combined in a series |
| 126 | ○ | ○ | ○ | Flutter kicking/holding pool bracket |
| 127 | ○ | ○ | ○ | Breathing exercises, called 'bobbing' (Rhythmic breathing series in vertical position, alternately breathing in at the surface, and dropping under surface to blow air out) |
| 128 | ○ | ○ | ○ | Wall exercises/for arms, legs, abdominals and other body parts |
| 129 | ○ | ○ | ○ | Floating exercises/with or without aid of a flotation device such as a flutter board for legs, abdominals and other body parts |
| 130 | ○ | ○ | ○ | Open water exercises/standing on pool floor, bending and stretching for arms, shoulders, waist, hips, and other body parts |
| 131 | ○ | ○ | ○ | Stretching, bending and twisting exercises - before the water exercise workout to warm-up at pool wall and/or in open water |
| 132 | ○ | ○ | ○ | Stretching, bending and twisting exercises - after the water exercise workout to cool-down at pool wall and/or in open water |
| 133 | ○ | ○ | ○ | Exercise routines/a set series of movements in open water often done to recorded music |
| 134 | ○ | ○ | ○ | Swimming/widthway of pool |
| 135 | ○ | ○ | ○ | Lap swimming/lengthway of pool for distance |
| 136 | ○ | ○ | ○ | Other, specify: ______________________<br>______________________ |

# Section III

## Profile of other leisure fitness & sport activities.

**Q25.**

| | Yes | No | Do You . . . |
|---|---|---|---|
| 137 | ○ | ○ | Know how to calculate your target heart rate? (An optimal rate at which your heart pumps blood, in beats per minute.) |
| 138 | ○ | ○ | Participate in regular vigorous exercise, any season of the year other than water exercise, for at least 25 minutes, two times a week? |
| 139 | ○ | ○ | Get some other kind of regular fitness exercise or sport activity? |

**Q26** Fill in the answer circles (○) below to indicate **How Often** and **How Long** the listed activities are performed.

| | | How Often | | | | | How Long | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Average Times/Week* | | | | | *Average Minutes/Session* | | | | |
| | | 0 | 1 | 2 | 3 | 4+ | 0 | 15 | 30 | 45+ | |
| 140 | Aerobic land exercise<br>*(vigorous heart/lung exercise)* | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 160 |
| 141 | Archery | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 161 |
| 142 | Basketball<br>*(or similar team sport)* | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 162 |
| 143 | Bowling or golf | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 163 |
| 144 | Boxing or wrestling | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 164 |
| 145 | Cross country skiing<br>*(for endurance/distance)* | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 165 |
| 146 | Cycling/bicycling<br>*(for endurance/distance)* | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 166 |
| 147 | Dancing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 167 |
| 148 | Downhill skiing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 168 |
| 149 | Horseshoe pitching | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 169 |
| 150 | Judo or karate | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 170 |
| 151 | Land walking/jogging | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 171 |
| 152 | Land exercise w/equip. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 172 |
| 153 | Racquet ball<br>*(or similar racquet sport)* | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 173 |
| 154 | SCUBA diving | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 174 |
| 155 | Sailing or canoeing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 175 |
| 156 | Shuffleboard | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 176 |
| 157 | Swimming<br>*(for endurance/distance)* | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 177 |
| 158 | Table tennis | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 178 |
| 159 | Other, specify: ______ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 179 |

*Page 6*

# Section IV
## Demographic Information

**Q27**. Residence: Identify your district
*(See Q28 for listing of states)*

180 ○ North East
181 ○ South East
182 ○ North Central
183 ○ South Central
184 ○ West

**Q28** Residence: Identify your state

***North East***

185 ○-MA ○-RI ○-NH ○-ME ○-VT
186 ○-CT ○-NJ ○-NY ○-PA ○-DE
187 ○-DC ○-MD ○-VA ○-WV

***South East***

188 ○-NC ○-SC ○-GA ○-FL ○-AL
189 ○-TN ○-MS ○-KY

***North Central***

190 ○-OH ○-IN ○-MI ○-IA ○-WI
191 ○-MN ○-SD ○-ND ○-IL ○-NB

***South Central***

192 ○-MO ○-KS ○-LA ○-AR ○-OK
193 ○-TX ○-CO ○-NM

***West***

194 ○-MT ○-WY ○-ID ○-UT ○-AZ
195 ○-NV ○-CA ○-HI ○-OR ○-WA
196 ○-AK

**Q29** Sex

197 ○ Female
198 ○ Male

**Q30** Age Bracket

199 ○ Under 20 years
200 ○ 20-39 years
201 ○ 40-59 years
202 ○ 60 years and up

**Q31** Marital Status

203 ○ Single
204 ○ Married
205 ○ Widowed
206 ○ Divorced
207 ○ Separated

**Q32**. Education

208 ○ Less than a high school diploma
209 ○ High school diploma
210 ○ Junior college or equivalent
211 ○ College/university undergraduate degree
212 ○ Multiple college/university undergraduate degrees
213 ○ Advanced degree (masters/doctorate)
214 ○ Multiple advanced degrees

**Q33** Current employment status

215 ○ Work full-time
216 ○ Work part-time
217 ○ Have a job, but not at work because of vacation, strike, illness
218 ○ Retired, no employment
219 ○ Retired, with interim part-time work
220 ○ In school
221 ○ Household engineer
222 ○ Other, specify: ______________________________
______________________________

**Q34** Annual income (current, all sources)

223 ○ Under $15,000
224 ○ $15,000-$40,000
225 ○ Over $40,000

**Q35** Ethnic groups (if you identify yourself with any ethnic group or groups, please specify.)

226 ○ ____________________
227 ○ ____________________

## And last but not least . . .

***Please return your completed survey in the accompanying self-addressed postage paid envelope to:***

***Dr. Joanna Midtlyng***
***School of Physical Education***
***Ball Gymnasium, 202A***
***Ball State University***
***Muncie, IN 47306***

***Note:*** *Please use the back of the survey to add any comments you may have about water exercise.*
***Also:*** *Please mail the enclosed postcard separately. Indicate if you would like a summary or complete report of the results.*

(Appendix A): Research Instrument outside back cover

*Survey layout and typesetting by: First Impressions*
*4100 W. Heath Drive*
*Muncie, IN 47304*
*(317) 288-0068*

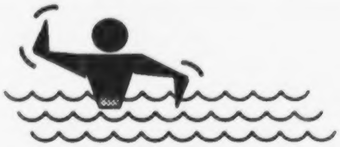
(Appendix A): Research Instrument Postcard Enclosure

## POSTCARD FRONT

**No Postage**
**Necessary**
**If Mailed**
**In the**
**United States**

**Business Reply Mail**
**First Class Permit #?? City,State**
**Postage will be Paid by Addressee**

**Dr. Joanna Midtlyng**
**School of Physical Eduation**
**Ball Gymnasium, 202A**
**Ball State University**
**Muncie, IN 47306**



I have completed and returned the survey in a separate mailing. When the study results have been analyzed, please send me the material listed below.

☐ Summary only ☐ Complete results

Name ______________________________
*Last Name* *First Name* *M.I.*

Street ______________________________

City ______________________________

State ______________ Zipcode ______________

☐ **I'm also willing to participate in a future update survey.** Date: ______________

## POSTCARD BACK
## 3-1/2" X 5-1/2"

# *APPENDIX B*

## *N.A.C.A.E.* Position Statement on Aquatic Exercise*
## *and*
## *Proposed Standards for Aquatic Exercise Programs*

### N.A.C.A.E. Position Statement on Aquatic Exercise

Aquatic exercise programs have been in existence and known by several different names for decades. Having evolved from a therapeutic base in hospital settings in England, formal hydrotherapy has given way to a more widely accepted form of water exercise.

Exercising in the water permits the individual to develop all the components of physical fitness: cardio-respiratory endurance, flexibility, muscular strength and endurance, balance, coordination, perceptual motor development, and body composition. It takes advantage of the variety of physical characteristics of water to produce the necessary overload for muscular development. The water's resistance and pressure subject the muscles to increased stress while the water's buoyancy, temperature and massage effect tend to relax and soothe muscles thus helping to decrease the usual muscular soreness generally associated with traditional land exercise programs.

Exercising in a pool tends to induce the relaxation response in an individual because a pool generally projects a relaxing atmosphere. This partial elimination of environmental stressors allows the body to respond more fully to the physiological benefits of exercise.

Since aquatic exercise may not require any swimming skill or deep water, a wide variety of people can participate in this fitness program. It should be recognized that while aquatic exercise is a viable exercise for the young fitness buff, it is especially good for the older individual as well as people with injuries or medical problems.

In view of the safe features and physiological and psychological benefits of aquatic exercise, the National Advisory Committee on Aquatic Exercise wholly endorses and recommends aquatic exercise as a safe and effective means for individuals to improve physical fitness. The NACAE has as its mission, to promote the concept of aquatic exercise nationally; develop standards to insure quality in aquatic exercise programs; and to encourage research in the field.

As a committee of the Council for National Cooperation in Aquatics, the NACAE aims to cooperate with all aquatic and fitness organizations in the coordination of aquatic exercise programs for the general public.

---

**N.A.C.A.E. denotes National Advisory Committee on Aquatic Exercise.*
*N.A.C.A.E. is a special committee of the Council for National Cooperation in Aquatics.*

## Proposed Standards for Aquatic Exercise Programs

Throughout the duration of an individual's participation in aquatic exercise, that individual shall:

1. Be treated as an individual with specific needs.

2. Be provided with experiences designed to improve one or more of the following:
    a. Cardia-pulmonary function
    b. Flexibility
    c. Muscular strength and/or endurance
    d. Balance, coordination, manipulatory skills
    e. Body composition

3. Be instructed by one who is knowledgeable and competent in:
    a. Anatomy and physiology
    b. Principles of exercise science and human response to exercise
    c. Concepts in psycho-social behavior
    d. Concepts in teaching and in teaching exercise skills
    e. Safety procedures

4. Be evaluated for improvement subjectively or objectively.

Sue W. White, Chair
N.A.C.A.E.* Standards Committee
Bell Center
Drake University
Des Moines, IA. 50311

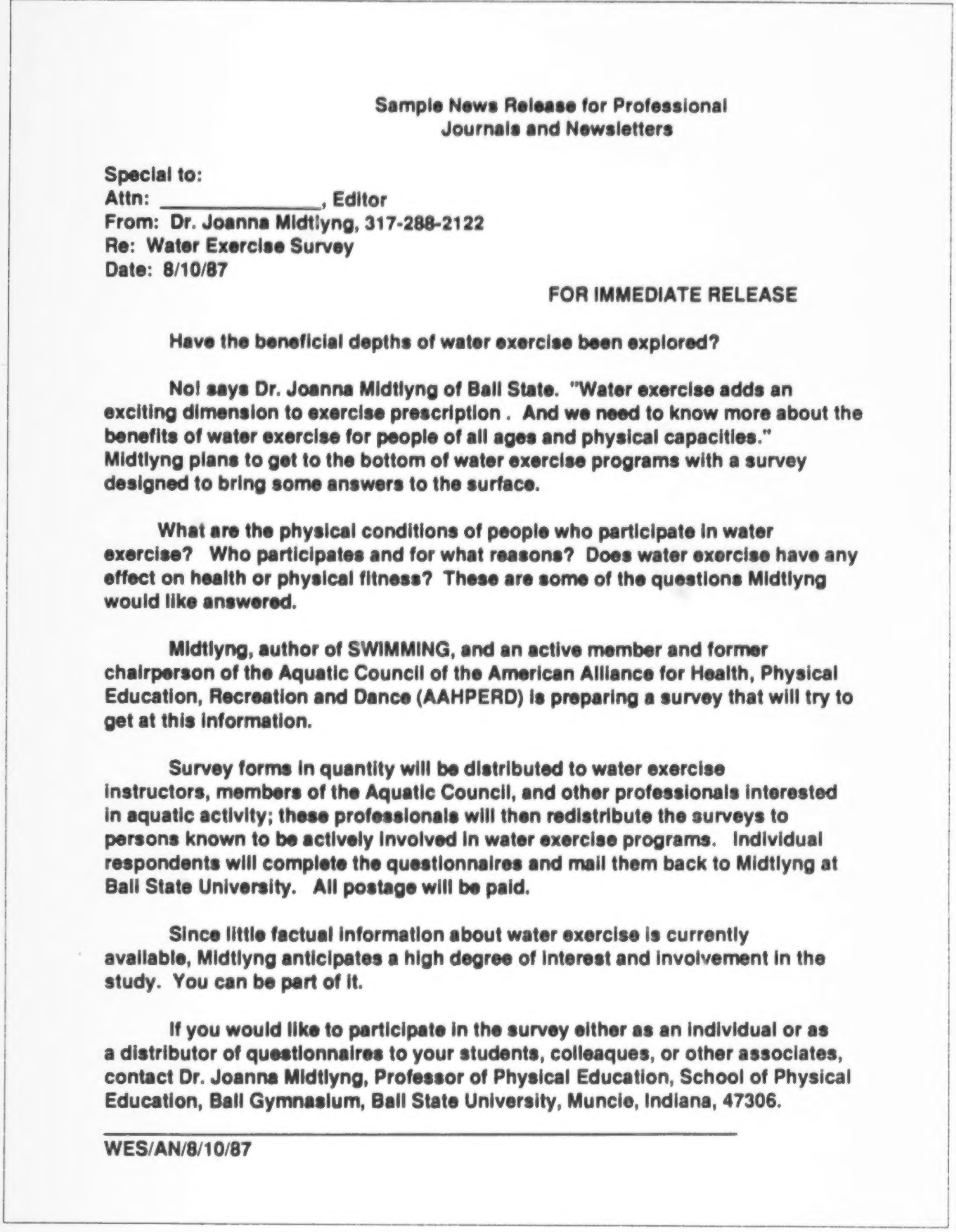
---

**N.A.C.A.E. denotes National Advisory Committee on Aquatic Exercise.*
*N.A.C.A.E. is a special committee of the Council for National Cooperation in Aquatics.*

# APPENDIX C

## *National News Release Samples*

(Appendix C): Sample News Release for Professional Journals and Newsletters



**Sample News Release for Professional**
**Journals and Newsletters**

**Special to:**
**Attn: _______________, Editor**
**From: Dr. Joanna Midtlyng, 317-288-2122**
**Re: Water Exercise Survey**
**Date: 8/10/87**

**FOR IMMEDIATE RELEASE**

**Have the beneficial depths of water exercise been explored?**

**No! says Dr. Joanna Midtlyng of Ball State. "Water exercise adds an exciting dimension to exercise prescription . And we need to know more about the benefits of water exercise for people of all ages and physical capacities." Midtlyng plans to get to the bottom of water exercise programs with a survey designed to bring some answers to the surface.**

**What are the physical conditions of people who participate in water exercise? Who participates and for what reasons? Does water exercise have any effect on health or physical fitness? These are some of the questions Midtlyng would like answered.**

**Midtlyng, author of SWIMMING, and an active member and former chairperson of the Aquatic Council of the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) is preparing a survey that will try to get at this information.**

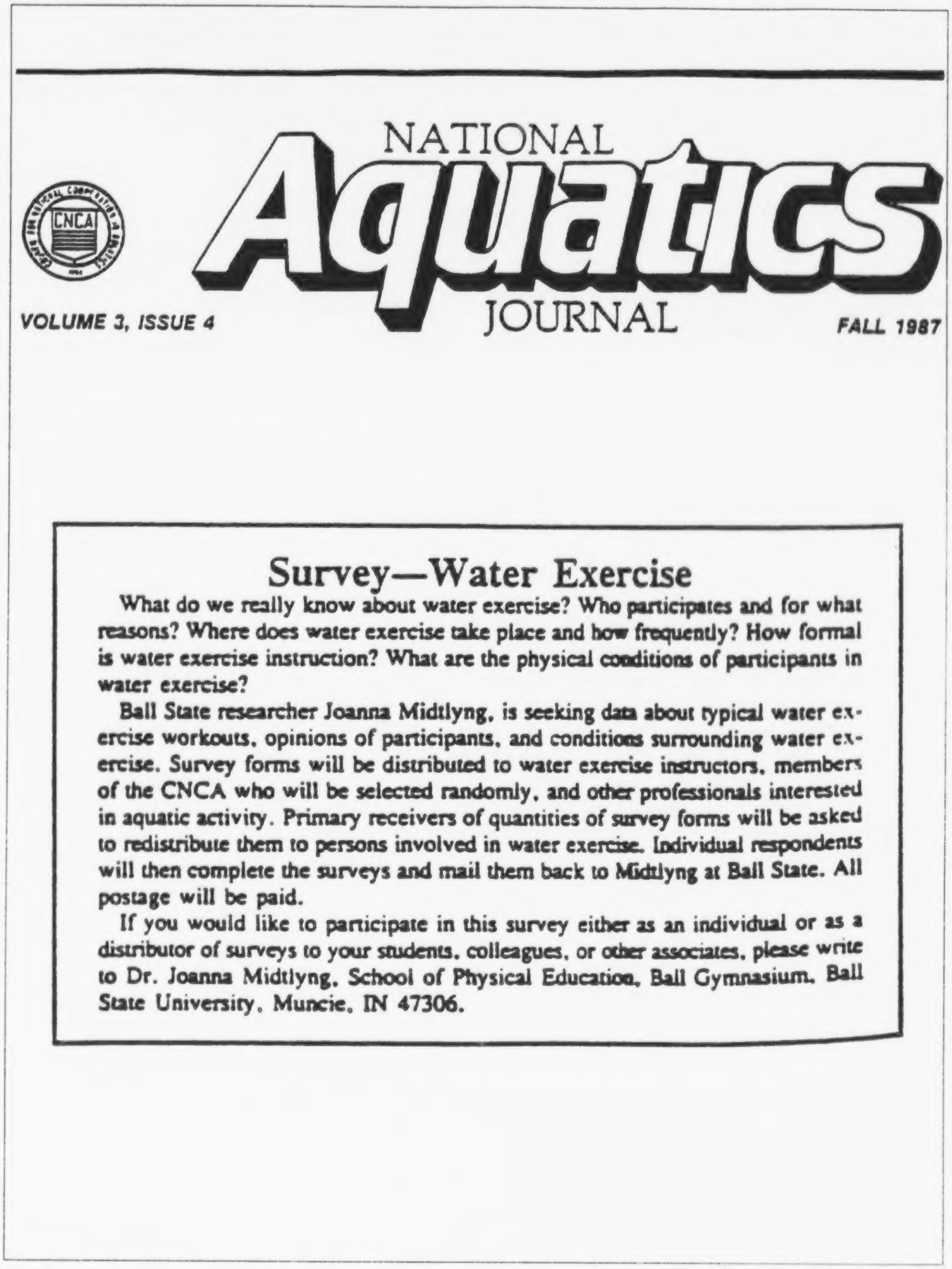
**Survey forms in quantity will be distributed to water exercise instructors, members of the Aquatic Council, and other professionals interested in aquatic activity; these professionals will then redistribute the surveys to persons known to be actively involved in water exercise programs. Individual respondents will complete the questionnaires and mail them back to Midtlyng at Ball State University. All postage will be paid.**

**Since little factual information about water exercise is currently available, Midtlyng anticipates a high degree of interest and involvement in the study. You can be part of it.**

**If you would like to participate in the survey either as an individual or as a distributor of questionnaires to your students, colleaques, or other associates, contact Dr. Joanna Midtlyng, Professor of Physical Education, School of Physical Education, Ball Gymnasium, Ball State University, Muncie, Indiana, 47306.**

**WES/AN/8/10/87**

(Appendix C): News Release as Published; National Aquatics Journal



NATIONAL Aquatics JOURNAL

VOLUME 3, ISSUE 4

FALL 1987

## Survey—Water Exercise

What do we really know about water exercise? Who participates and for what reasons? Where does water exercise take place and how frequently? How formal is water exercise instruction? What are the physical conditions of participants in water exercise?

Ball State researcher Joanna Midtlyng, is seeking data about typical water exercise workouts, opinions of participants, and conditions surrounding water exercise. Survey forms will be distributed to water exercise instructors, members of the CNCA who will be selected randomly, and other professionals interested in aquatic activity. Primary receivers of quantities of survey forms will be asked to redistribute them to persons involved in water exercise. Individual respondents will then complete the surveys and mail them back to Midtlyng at Ball State. All postage will be paid.

If you would like to participate in this survey either as an individual or as a distributor of surveys to your students, colleagues, or other associates, please write to Dr. Joanna Midtlyng, School of Physical Education, Ball Gymnasium, Ball State University, Muncie, IN 47306.

(Appendix C): News Release as published; The AKWA Letter

## Survey on Aquatics to be conducted

What do we *really know* about the benefits and limitations of water exercise? Who participates and for what reasons? Where does water exercise take place and how frequently? What are the physical conditions of participants in water exercise? How formal is water exercise instruction? Does water exercise have any effect on sexuality, health or physical fitness?

These are a few of the facts that Ball State researcher, Dr. Joanna Midtlyng, would like to know. Midtlyng, an active member and former chairperson of the Aquatic Council of the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD), is preparing a survey that will try to uncover this information.

Survey forms will be distributed to water exercise instructors, randomly selected members of the Aquatic Exercise Association, and other professionals interested in aquatic activity. Primary receivers of quantities of survey forms will be asked to redistribute them to persons who are known to be actively involved in water exercise. Individual respondents will then complete the surveys and mail them back to Midtlyng at Ball State. All postage will be paid.

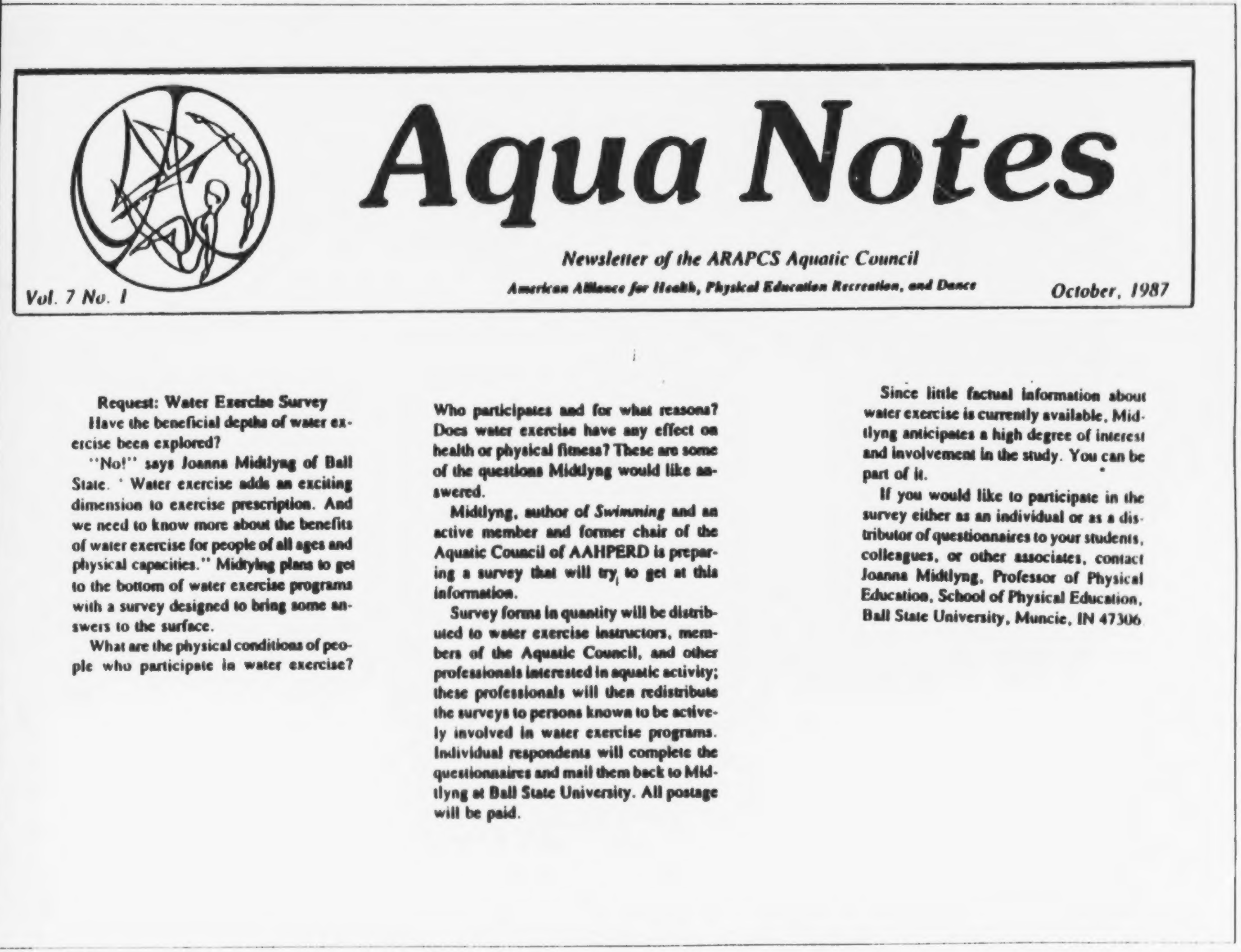
If you would like to participate in this survey, either as an individual or as a distributor of surveys to your students, colleagues, or other associates, please call Dr. Midtlyng at (317) 285-5167 (work) or call her collect at home, (317) 288-2122.

Since little factual information about water exercise is currently available, Dr. Midtlyng expects a high degree of interest and co-operation in this study. For additional information about the survey, write Dr. Joanna Midtlyng, School of Physical Education, Ball Gymnasium, Ball State University, Muncie, Indiana, 47306.

Aquatic Exercise Association
P.O. Box 497
Port Washington, WI 53074

The AKWA Letter, Vol. 1, No. 3, Sept. 1987.

(Appendix C): News Release as published; Aqua Notes



# Aqua Notes

*Newsletter of the ARAPCS Aquatic Council*

*American Alliance for Health, Physical Education Recreation, and Dance*

*Vol. 7 No. 1*

*October, 1987*

## Request: Water Exercise Survey

Have the beneficial depths of water exercise been explored?

"No!" says Joanna Midtlyng of Ball State. ' Water exercise adds an exciting dimension to exercise prescription. And we need to know more about the benefits of water exercise for people of all ages and physical capacities." Midtying plans to get to the bottom of water exercise programs with a survey designed to bring some answers to the surface.

What are the physical conditions of people who participate in water exercise? Who participates and for what reasons? Does water exercise have any effect on health or physical fitness? These are some of the questions Midtlyng would like answered.

Midtlyng, author of *Swimming* and an active member and former chair of the Aquatic Council of AAHPERD is preparing a survey that will try to get at this information.

Survey forms in quantity will be distributed to water exercise instructors, members of the Aquatic Council, and other professionals interested in aquatic activity; these professionals will then redistribute the surveys to persons known to be actively involved in water exercise programs. Individual respondents will complete the questionnaires and mail them back to Midtlyng at Ball State University. All postage will be paid.

Since little factual information about water exercise is currently available, Midtlyng anticipates a high degree of interest and involvement in the study. You can be part of it.

If you would like to participate in the survey either as an individual or as a distributor of questionnaires to your students, colleagues, or other associates, contact Joanna Midtlyng, Professor of Physical Education, School of Physical Education, Ball State University, Muncie, IN 47306.

## (Appendix C): Sample News Release for Selected Trade Magazines

### Sample News Release for Selected Trade Magazines

**Editor:**
**From: Dr. Joanna Midtlyng**
**Aquatic Education Consultant**
**317-285-5167, Office; 317-288-2122 Home**
**Re: Water Exercise Survey**
**Date: 10/15/87**

**FOR IMMEDIATE RELEASE**

**A pool is more than a wet place. It's a place of relaxation, revitalization and rehabilitation. What do the people who buy and maintain pools know about the benefits of simple water exercise?**

**Everyone knows there is a tremendous increase in the popularity of pools and spas. Interest in water exercise is also increasing. But so far, there is not enough information about what kind of water exercises are most popular or most beneficial. Nor does anyone really know who participates. What are the ages, physical conditions and income levels of people who enjoy water exercise? Can you think of ways you might use this information to market your products, your facilities or your programs?**

**An important national study in water exercise is now underway. It involves water exercise participants, teachers, recreation directors, health rehabilitation specialists, and gerontologists. The results of this study could have substantial impact on your products and services. For this reason, Dr. Joanna Midtlyng, an aquatic education consultant and a professor of physical education, wants your input about what kinds of information pool and spa owners and managers would find useful.**

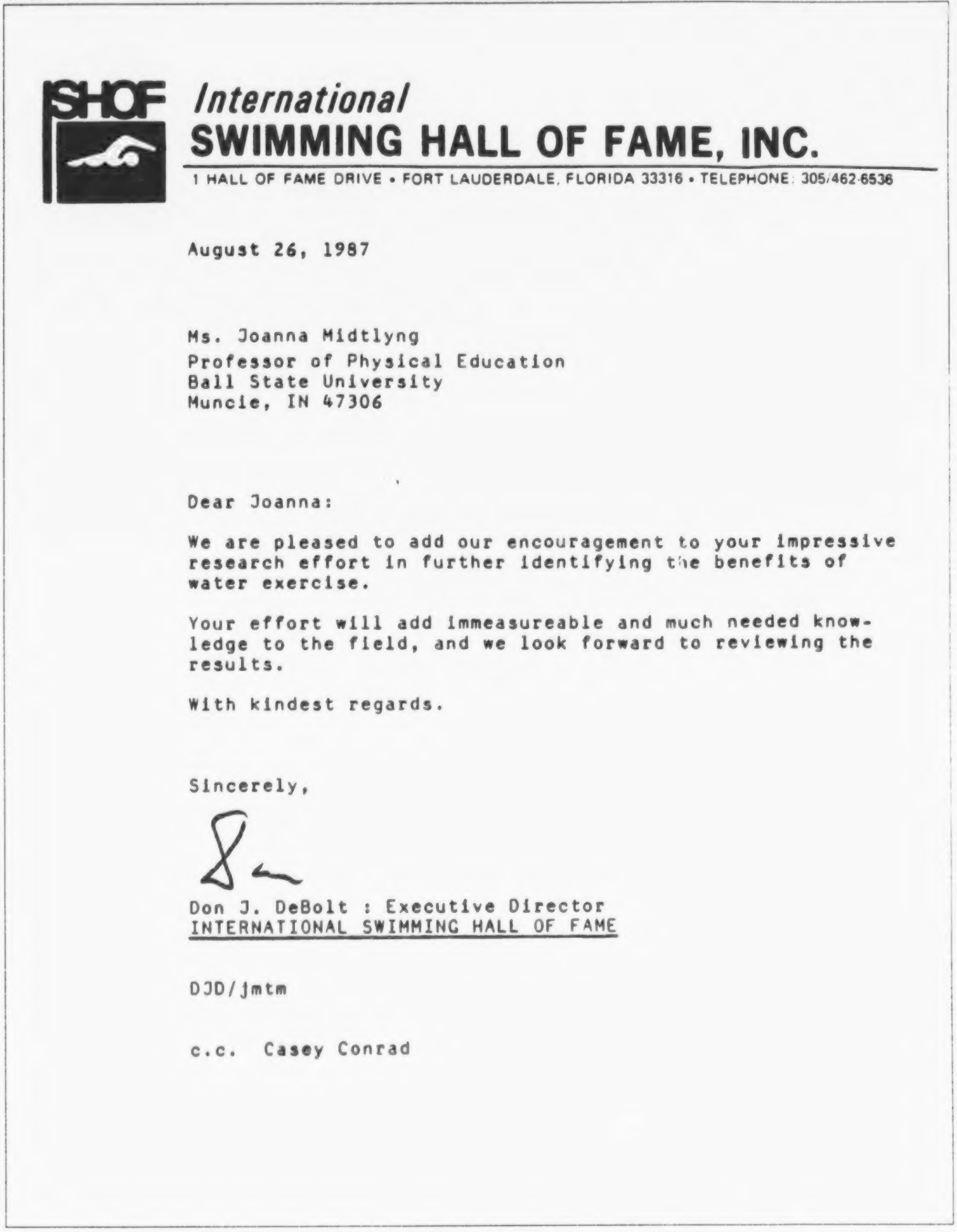
**If you have an interest in marketing your products or extending the use of your facility through water exercise programs please contact Dr. Joanna Midtlyng, Professor of Physical Education, School of Physical Education, 202 A Ball Gymnasium, Ball State University, Muncie, Indiana 47306. Phone 317-285-5167 (W) or 317-288-2122 (H).**

**####**

# APPENDIX D

## External Letters of Support

(Appendix D): Int'l Swimming Hall of Fame, Inc. Letter of Support



ISHOF International
SWIMMING HALL OF FAME, INC.
1 HALL OF FAME DRIVE • FORT LAUDERDALE, FLORIDA 33316 • TELEPHONE: 305/462-6536

August 26, 1987

Ms. Joanna Midtlyng
Professor of Physical Education
Ball State University
Muncie, IN 47306

Dear Joanna:

We are pleased to add our encouragement to your impressive research effort in further identifying the benefits of water exercise.

Your effort will add immeasureable and much needed knowledge to the field, and we look forward to reviewing the results.

With kindest regards.

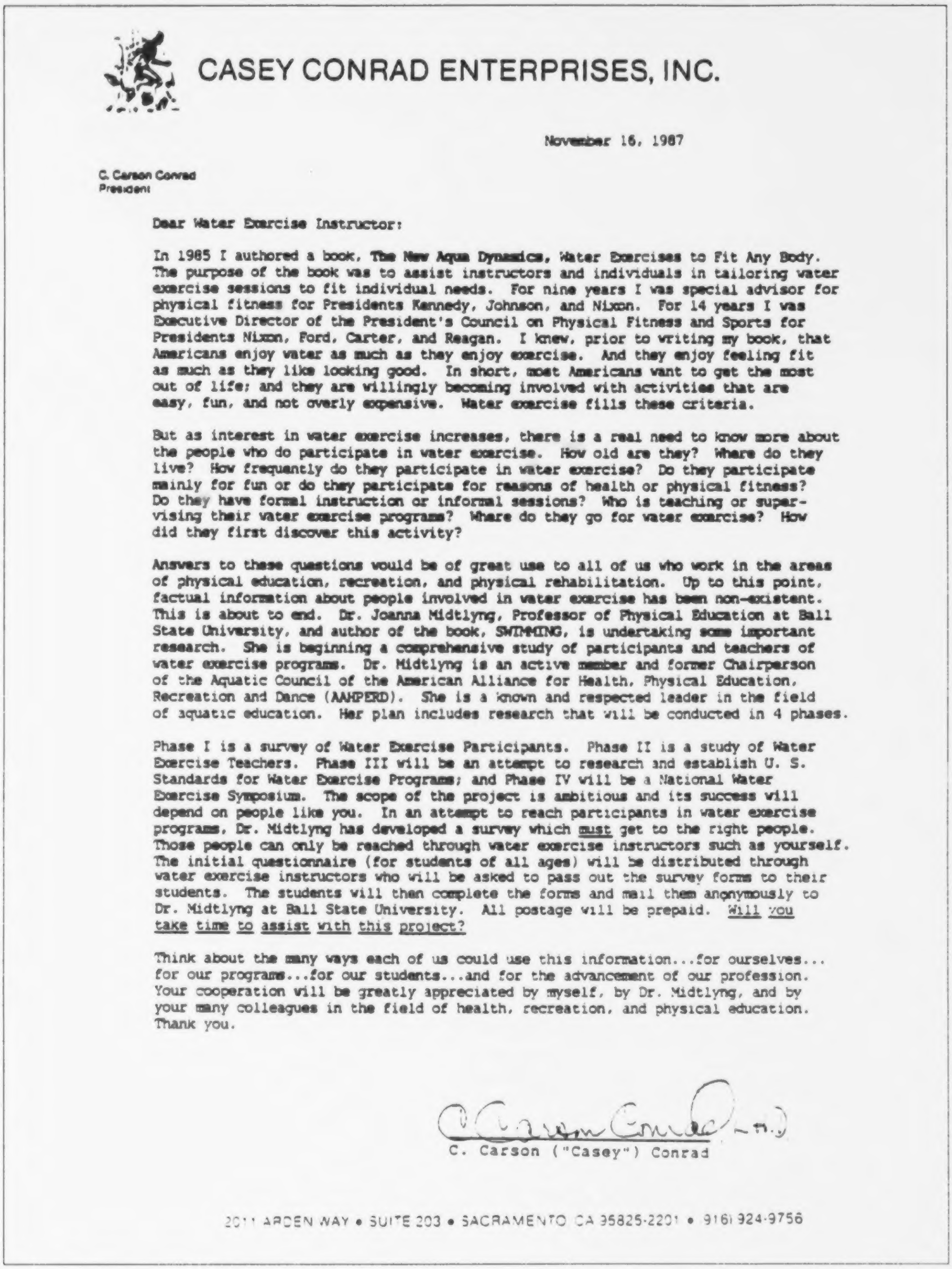
Sincerely,

Don J. DeBolt : Executive Director
INTERNATIONAL SWIMMING HALL OF FAME

DJD/jmtm

c.c. Casey Conrad

## (Appendix D): Casey Conrad Enterprises, Inc. Letter of Support



CASEY CONRAD ENTERPRISES, INC.

November 16, 1987

C. Carson Conrad
President

Dear Water Exercise Instructor:

In 1985 I authored a book, **The New Aqua Dynamics**, Water Exercises to Fit Any Body. The purpose of the book was to assist instructors and individuals in tailoring water exercise sessions to fit individual needs. For nine years I was special advisor for physical fitness for Presidents Kennedy, Johnson, and Nixon. For 14 years I was Executive Director of the President's Council on Physical Fitness and Sports for Presidents Nixon, Ford, Carter, and Reagan. I knew, prior to writing my book, that Americans enjoy water as much as they enjoy exercise. And they enjoy feeling fit as much as they like looking good. In short, most Americans want to get the most out of life; and they are willingly becoming involved with activities that are easy, fun, and not overly expensive. Water exercise fills these criteria.

But as interest in water exercise increases, there is a real need to know more about the people who do participate in water exercise. How old are they? Where do they live? How frequently do they participate in water exercise? Do they participate mainly for fun or do they participate for reasons of health or physical fitness? Do they have formal instruction or informal sessions? Who is teaching or supervising their water exercise programs? Where do they go for water exercise? How did they first discover this activity?

Answers to these questions would be of great use to all of us who work in the areas of physical education, recreation, and physical rehabilitation. Up to this point, factual information about people involved in water exercise has been non-existent. This is about to end. Dr. Joanna Midtlyng, Professor of Physical Education at Ball State University, and author of the book, SWIMMING, is undertaking some important research. She is beginning a comprehensive study of participants and teachers of water exercise programs. Dr. Midtlyng is an active member and former Chairperson of the Aquatic Council of the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD). She is a known and respected leader in the field of aquatic education. Her plan includes research that will be conducted in 4 phases.

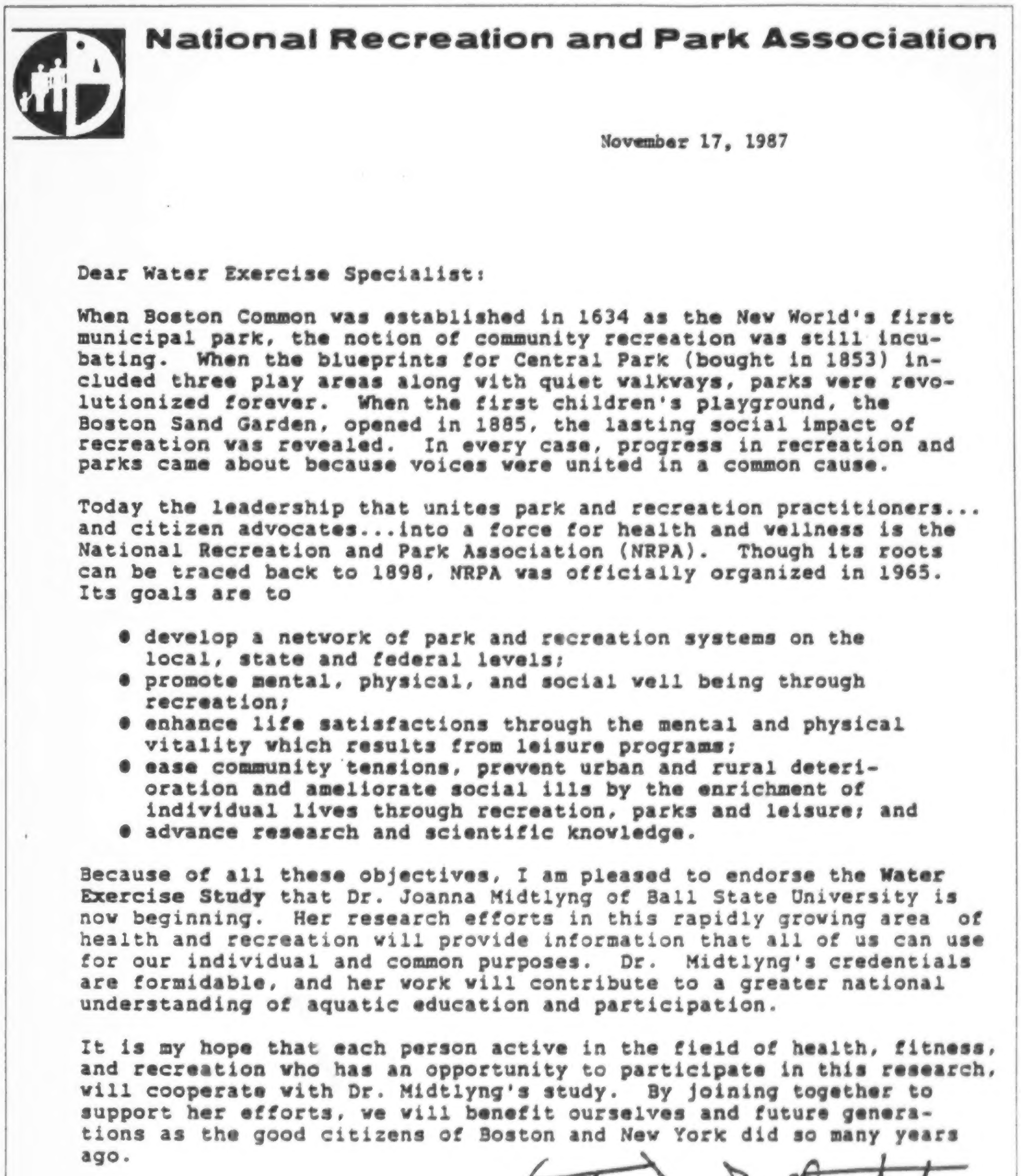
Phase I is a survey of Water Exercise Participants. Phase II is a study of Water Exercise Teachers. Phase III will be an attempt to research and establish U. S. Standards for Water Exercise Programs; and Phase IV will be a National Water Exercise Symposium. The scope of the project is ambitious and its success will depend on people like you. In an attempt to reach participants in water exercise programs, Dr. Midtlyng has developed a survey which must get to the right people. Those people can only be reached through water exercise instructors such as yourself. The initial questionnaire (for students of all ages) will be distributed through water exercise instructors who will be asked to pass out the survey forms to their students. The students will then complete the forms and mail them anonymously to Dr. Midtlyng at Ball State University. All postage will be prepaid. Will you take time to assist with this project?

Think about the many ways each of us could use this information...for ourselves... for our programs...for our students...and for the advancement of our profession. Your cooperation will be greatly appreciated by myself, by Dr. Midtlyng, and by your many colleagues in the field of health, recreation, and physical education. Thank you.

C. Carson ("Casey") Conrad

2011 ARDEN WAY • SUITE 203 • SACRAMENTO CA 95825-2201 • (916) 924-9756

## (Appendix D): National Recreation and Park Association Letter of Support



**National Recreation and Park Association**

November 17, 1987

Dear Water Exercise Specialist:

When Boston Common was established in 1634 as the New World's first municipal park, the notion of community recreation was still incubating. When the blueprints for Central Park (bought in 1853) included three play areas along with quiet walkways, parks were revolutionized forever. When the first children's playground, the Boston Sand Garden, opened in 1885, the lasting social impact of recreation was revealed. In every case, progress in recreation and parks came about because voices were united in a common cause.

Today the leadership that unites park and recreation practitioners... and citizen advocates...into a force for health and wellness is the National Recreation and Park Association (NRPA). Though its roots can be traced back to 1898, NRPA was officially organized in 1965. Its goals are to

- develop a network of park and recreation systems on the local, state and federal levels;
- promote mental, physical, and social well being through recreation;
- enhance life satisfactions through the mental and physical vitality which results from leisure programs;
- ease community tensions, prevent urban and rural deterioration and ameliorate social ills by the enrichment of individual lives through recreation, parks and leisure; and
- advance research and scientific knowledge.

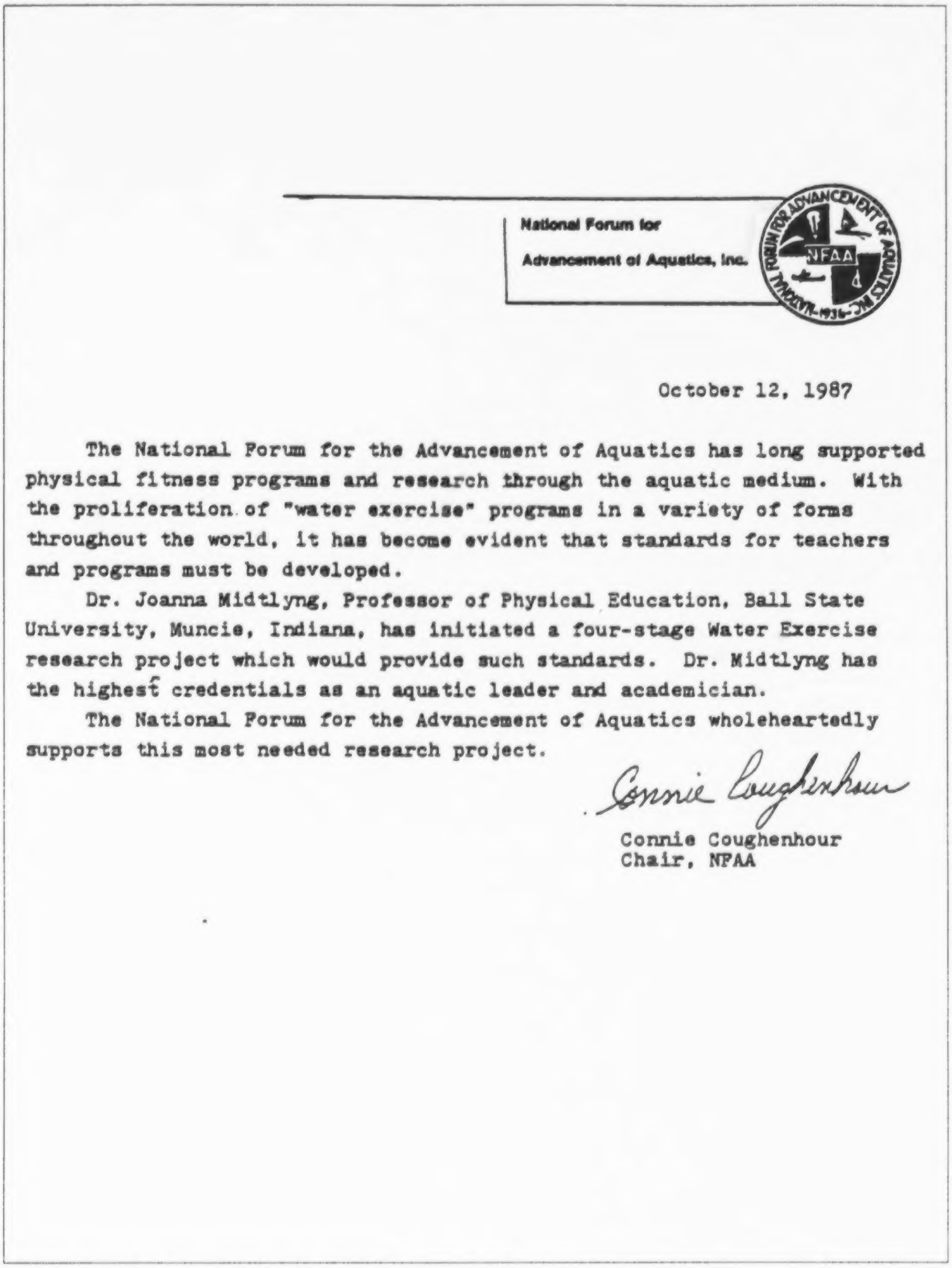
Because of all these objectives, I am pleased to endorse the **Water Exercise Study** that Dr. Joanna Midtlyng of Ball State University is now beginning. Her research efforts in this rapidly growing area of health and recreation will provide information that all of us can use for our individual and common purposes. Dr. Midtlyng's credentials are formidable, and her work will contribute to a greater national understanding of aquatic education and participation.

It is my hope that each person active in the field of health, fitness, and recreation who has an opportunity to participate in this research, will cooperate with Dr. Midtlyng's study. By joining together to support her efforts, we will benefit ourselves and future generations as the good citizens of Boston and New York did so many years ago.

Kent J. Blumenthal, Chief
Information Resource Center

3101 Park Center Drive • Alexandria, Virginia 22302 • *(703) 820-4940*

## (Appendix D): National Forum for Advancement of Aquatics Inc. Letter of Support



National Forum for
Advancement of Aquatics, Inc.

October 12, 1987

The National Forum for the Advancement of Aquatics has long supported physical fitness programs and research through the aquatic medium. With the proliferation of "water exercise" programs in a variety of forms throughout the world, it has become evident that standards for teachers and programs must be developed.

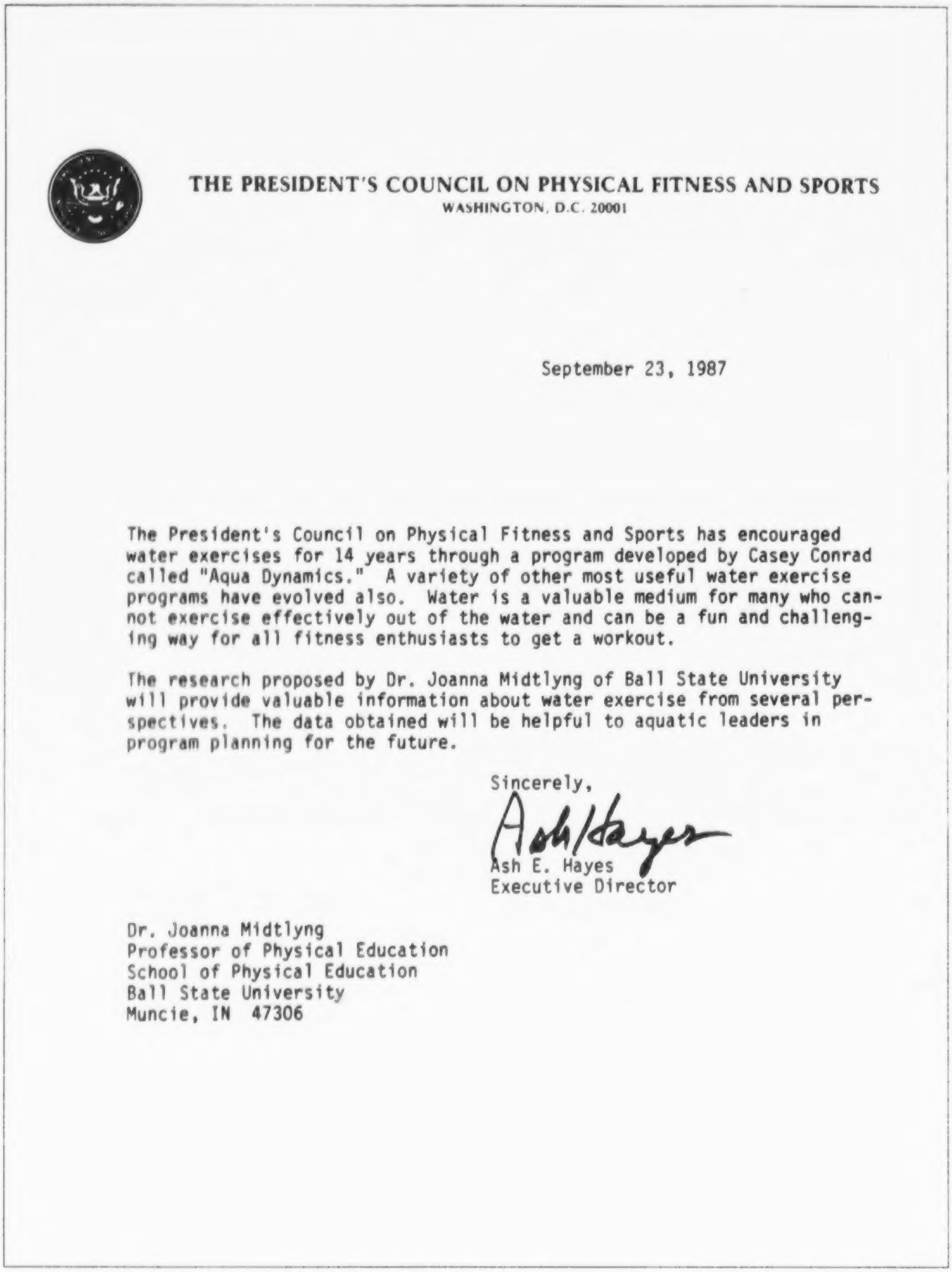
Dr. Joanna Midtlyng, Professor of Physical Education, Ball State University, Muncie, Indiana, has initiated a four-stage Water Exercise research project which would provide such standards. Dr. Midtlyng has the highest credentials as an aquatic leader and academician.

The National Forum for the Advancement of Aquatics wholeheartedly supports this most needed research project.

Connie Coughenhour

Connie Coughenhour
Chair, NFAA

## (Appendix D): The President's Council on Physical Fitness & Sports Letter of Support



THE PRESIDENT'S COUNCIL ON PHYSICAL FITNESS AND SPORTS
WASHINGTON, D.C. 20001

September 23, 1987

The President's Council on Physical Fitness and Sports has encouraged water exercises for 14 years through a program developed by Casey Conrad called "Aqua Dynamics." A variety of other most useful water exercise programs have evolved also. Water is a valuable medium for many who cannot exercise effectively out of the water and can be a fun and challenging way for all fitness enthusiasts to get a workout.

The research proposed by Dr. Joanna Midtlyng of Ball State University will provide valuable information about water exercise from several perspectives. The data obtained will be helpful to aquatic leaders in program planning for the future.

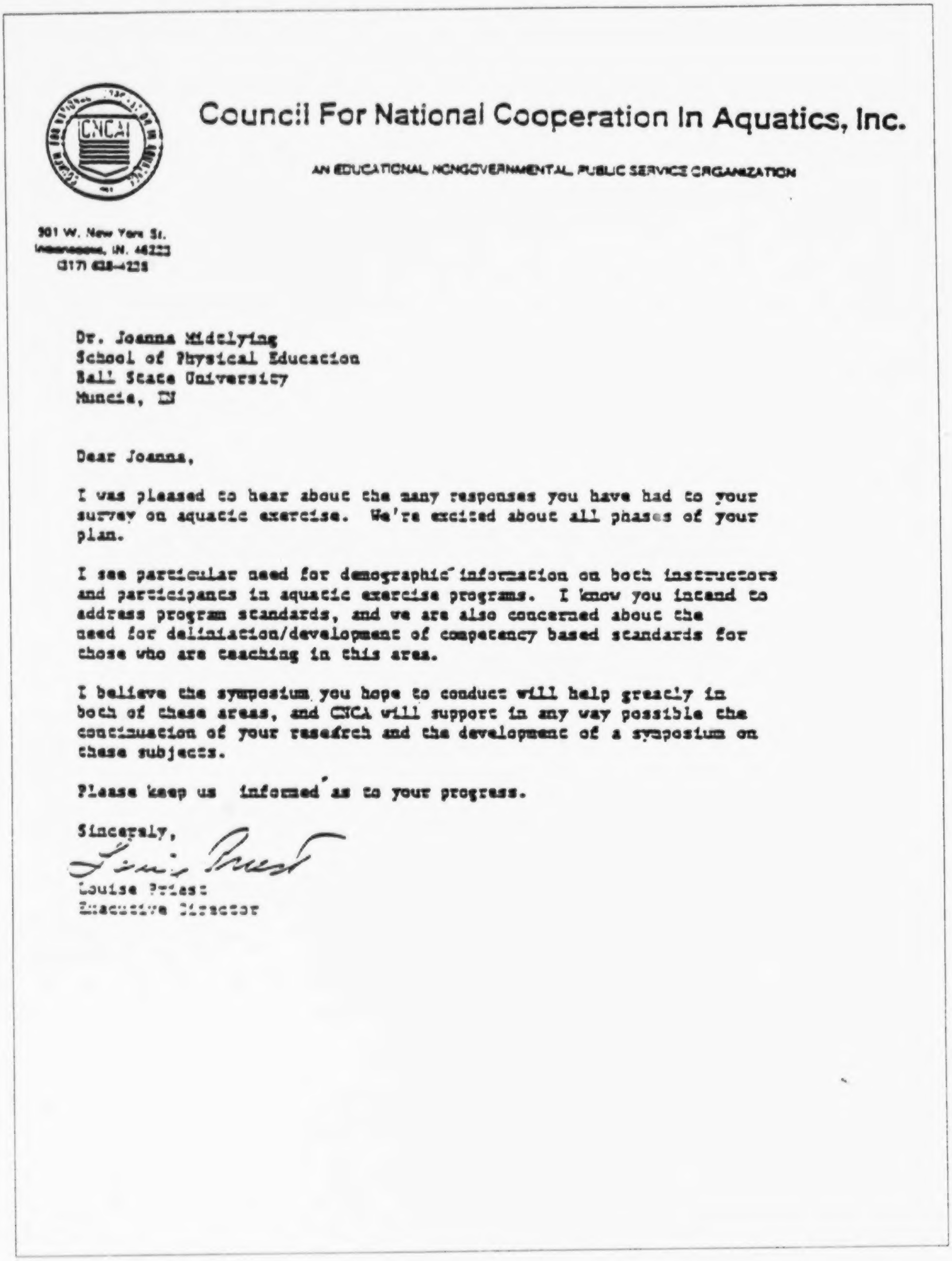
Sincerely,

Ash Hayes

Ash E. Hayes
Executive Director

Dr. Joanna Midtlyng
Professor of Physical Education
School of Physical Education
Ball State University
Muncie, IN 47306

(Appendix D): Council For National Cooperation In Aquatics, Inc. Letter of Support



Council For National Cooperation In Aquatics, Inc.

AN EDUCATIONAL, NONGOVERNMENTAL, PUBLIC SERVICE ORGANIZATION

901 W. New York St.
Indianapolis, IN. 46223
(317) 638-4238

Dr. Joanna Midtlying
School of Physical Education
Ball State University
Muncie, IN

Dear Joanna,

I was pleased to hear about the many responses you have had to your survey on aquatic exercise. We're excited about all phases of your plan.

I see particular need for demographic information on both instructors and participants in aquatic exercise programs. I know you intend to address program standards, and we are also concerned about the need for deliniation/development of competency based standards for those who are teaching in this area.

I believe the symposium you hope to conduct will help greatly in both of these areas, and CNCA will support in any way possible the continuation of your research and the development of a symposium on these subjects.

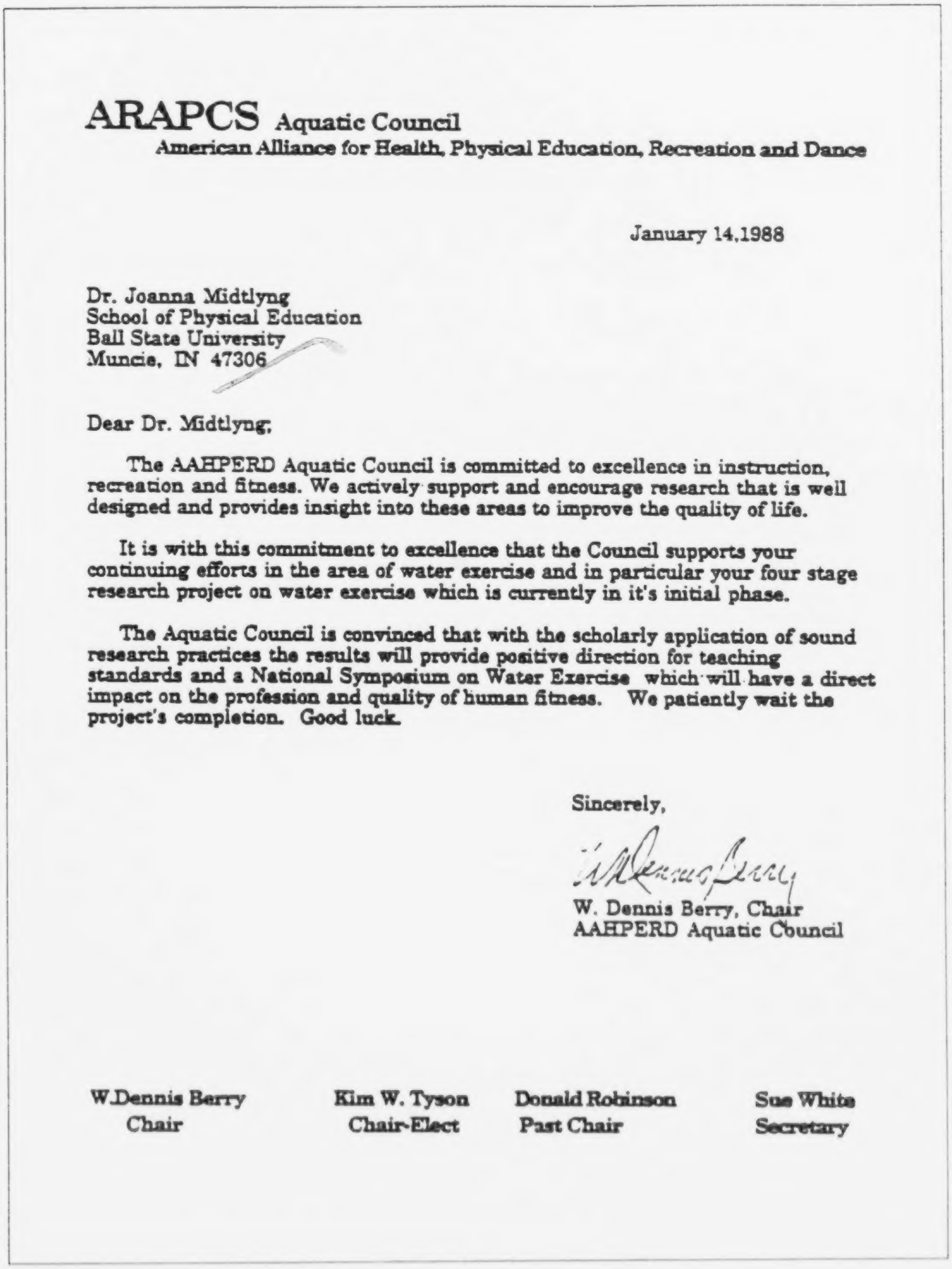
Please keep us informed as to your progress.

Sincerely,

Louise Priest

Louise Priest
Executive Director

(Appendix D): ARAPCS Aquatic Council Letter of Support



**ARAPCS** Aquatic Council
American Alliance for Health, Physical Education, Recreation and Dance

January 14,1988

Dr. Joanna Midtlyng
School of Physical Education
Ball State University
Muncie, IN 47306

Dear Dr. Midtlyng;

The AAHPERD Aquatic Council is committed to excellence in instruction, recreation and fitness. We actively support and encourage research that is well designed and provides insight into these areas to improve the quality of life.

It is with this commitment to excellence that the Council supports your continuing efforts in the area of water exercise and in particular your four stage research project on water exercise which is currently in it's initial phase.

The Aquatic Council is convinced that with the scholarly application of sound research practices the results will provide positive direction for teaching standards and a National Symposium on Water Exercise which will have a direct impact on the profession and quality of human fitness. We patiently wait the project's completion. Good luck.

Sincerely,

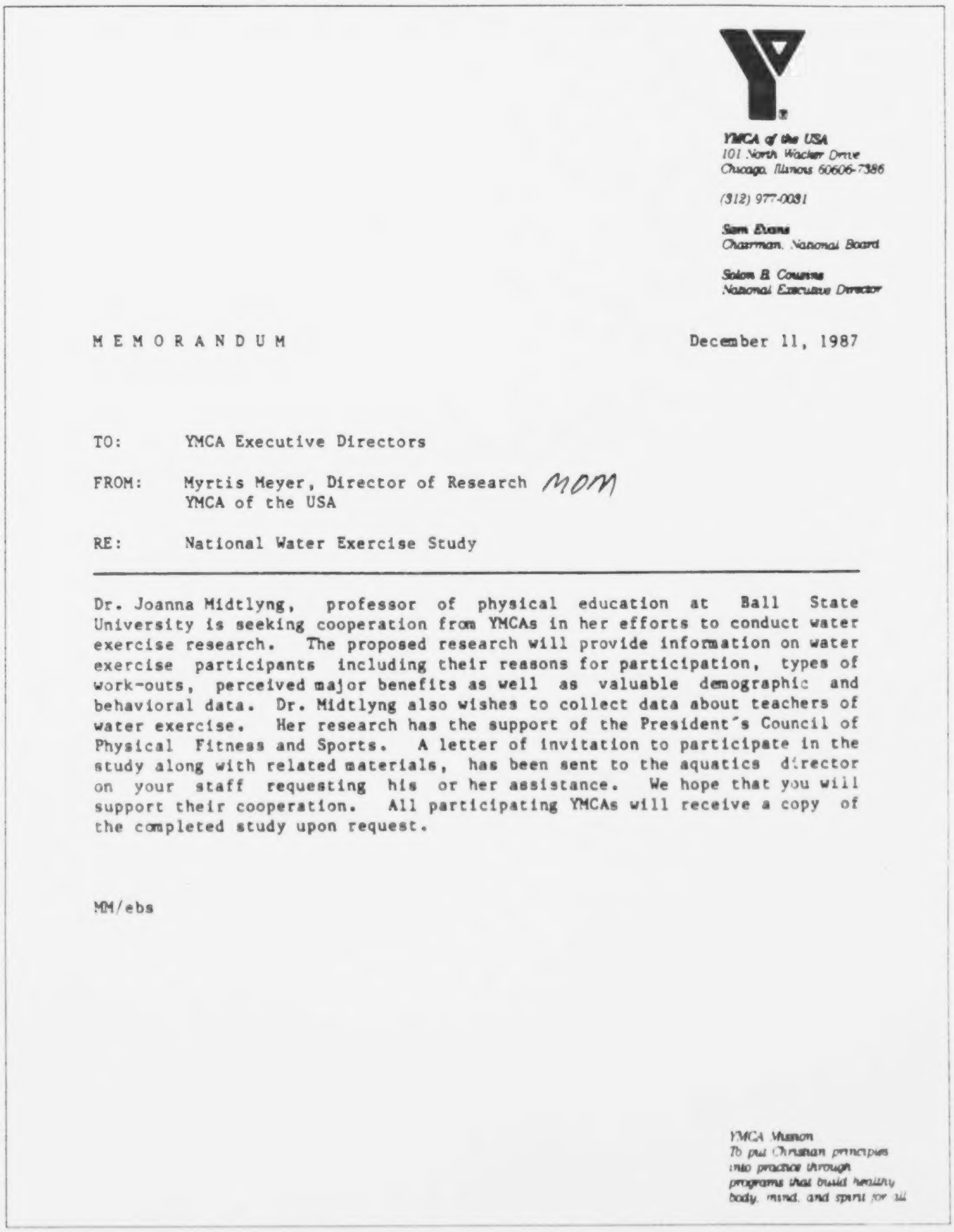
W Dennis Berry

W. Dennis Berry, Chair
AAHPERD Aquatic Council

| | | | |
|---|---|---|---|
| W.Dennis Berry | Kim W. Tyson | Donald Robinson | Sue White |
| Chair | Chair-Elect | Past Chair | Secretary |

# APPENDIX E

## *Letters from the Director of Research, YMCA of USA*
## *to YMCA Executive Directors and Aquatic Directors*



*YMCA of the USA*
*101 North Wacker Drive*
*Chicago, Illinois 60606-7386*

*(312) 977-0031*

***Sam Evans***
*Chairman, National Board*

***Solon B. Cousins***
*National Executive Director*

MEMORANDUM

December 11, 1987

TO: YMCA Executive Directors

FROM: Myrtis Meyer, Director of Research MDM
YMCA of the USA

RE: National Water Exercise Study

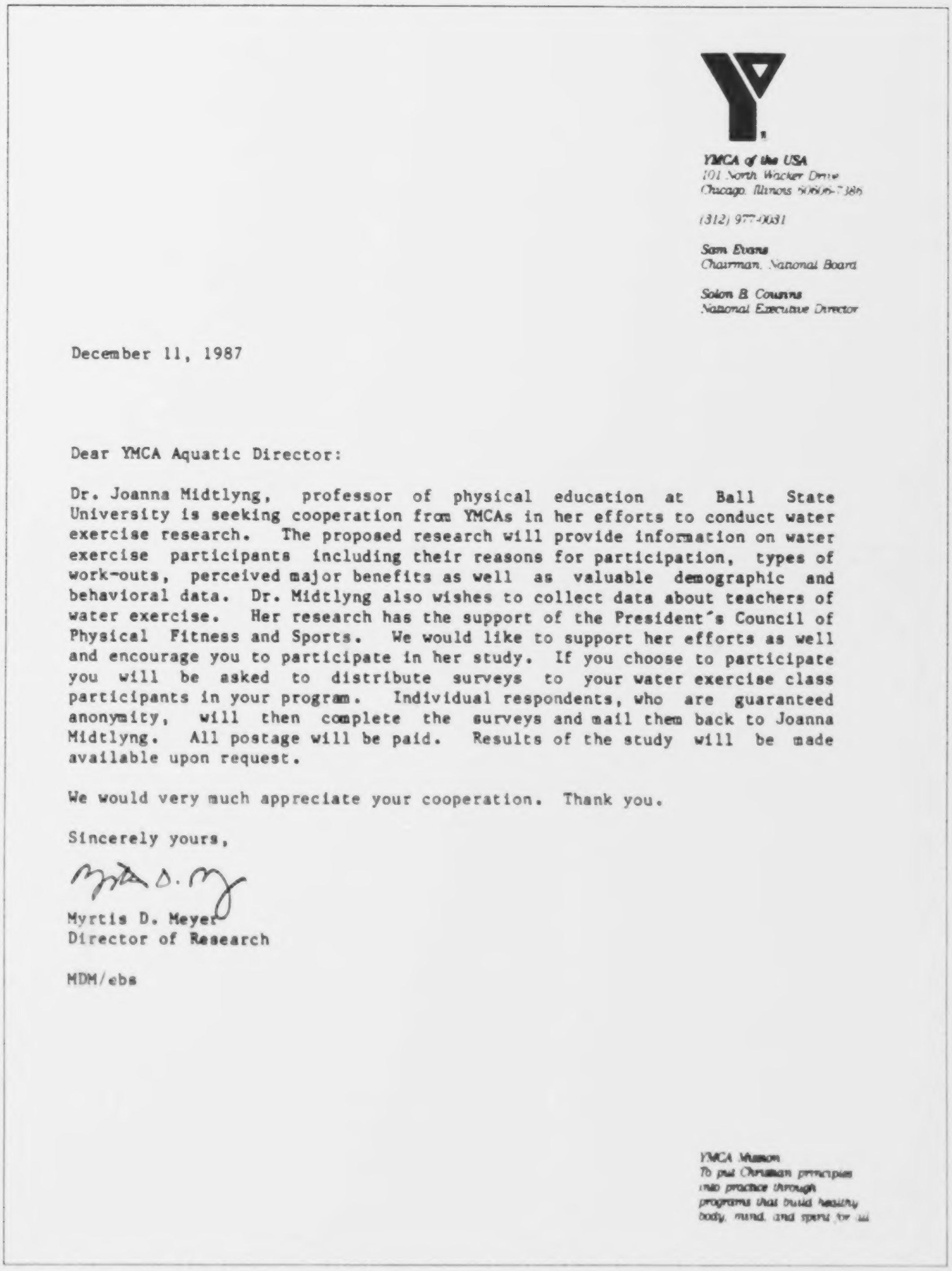
---

Dr. Joanna Midtlyng, professor of physical education at Ball State University is seeking cooperation from YMCAs in her efforts to conduct water exercise research. The proposed research will provide information on water exercise participants including their reasons for participation, types of work-outs, perceived major benefits as well as valuable demographic and behavioral data. Dr. Midtlyng also wishes to collect data about teachers of water exercise. Her research has the support of the President's Council of Physical Fitness and Sports. A letter of invitation to participate in the study along with related materials, has been sent to the aquatics director on your staff requesting his or her assistance. We hope that you will support their cooperation. All participating YMCAs will receive a copy of the completed study upon request.

MM/ebs

*YMCA Mission*
*To put Christian principles*
*into practice through*
*programs that build healthy*
*body, mind, and spirit for all*

## (Appendix B): Letter to Aquatic Directors



*YMCA of the USA*
*101 North Wacker Drive*
*Chicago, Illinois 60606-7386*

*(312) 977-0031*

*Sam Evans*
*Chairman, National Board*

*Solon B. Cousins*
*National Executive Director*

December 11, 1987

Dear YMCA Aquatic Director:

Dr. Joanna Midtlyng, professor of physical education at Ball State University is seeking cooperation from YMCAs in her efforts to conduct water exercise research. The proposed research will provide information on water exercise participants including their reasons for participation, types of work-outs, perceived major benefits as well as valuable demographic and behavioral data. Dr. Midtlyng also wishes to collect data about teachers of water exercise. Her research has the support of the President's Council of Physical Fitness and Sports. We would like to support her efforts as well and encourage you to participate in her study. If you choose to participate you will be asked to distribute surveys to your water exercise class participants in your program. Individual respondents, who are guaranteed anonymity, will then complete the surveys and mail them back to Joanna Midtlyng. All postage will be paid. Results of the study will be made available upon request.

We would very much appreciate your cooperation. Thank you.

Sincerely yours,

Myrtis D. Meyer
Director of Research

MDM/ebs

*YMCA Mission*
*To put Christian principles*
*into practice through*
*programs that build healthy*
*body, mind, and spirit for all*

# *APPENDIX F*

## *Demographic Data for Water Exercise Teachers*

**TABLE A**
**Teachers of Water Exercise**

| Response | No. | % |
|---|---|---|
| Yes | 132 | 93.0 |
| No | 9 | 6.3 |
| No response | 1 | .7 |
| Total | 142 | 100.0 |

**TABLE B**
**Water Exercise Teachers Who Accepted the Invitation to Distribute the Survey to Participants**

| Response | No. | % |
|---|---|---|
| Yes | 137 | 96.5 |
| No | 2 | 1.4 |
| No response | 3 | 2.1 |
| Total | 142 | 100.00 |

**TABLE C**
**Water Exercise Teachers Who were Willing to Participate in a Water Exercise Teacher/Program Survey in 1988**

| Response | No. | % |
|---|---|---|
| Yes | 137 | 96.5 |
| No response | 5 | 3.5 |
| Total | 142 | 100.0 |

**TABLE D**
**Sex of Water Exercise Teachers**

| Sex | No. | % |
|---|---|---|
| Female | 128 | 90.1 |
| Male | 10 | 7.0 |
| No response | 4 | 2.8 |
| Total | 142 | 100.0 |

**TABLE E**
**Educational Background of Water Exercise Teachers**

| Education | No. | % |
|---|---|---|
| No H.School Diploma | 1 | .7 |
| High School Diploma | 17 | 12.0 |
| Junior College | 21 | 14.8 |
| College Degree | 49 | 34.5 |
| Advanced Degree | 39 | 27.5 |
| Other | 4 | 2.8 |
| No response | 11 | 7.7 |
| Total | 142 | 100.0 |

**TABLE F**
**Water Exercise Teachers with Background of Special Water Workshops**

| Response | No. | % |
|---|---|---|
| Yes | 88 | 62.0 |
| No | 33 | 23.2 |
| Other | 11 | 7.7 |
| No response | 10 | 7.0 |
| Total | 142 | 100.0 |

**TABLE G**
**Water Exercise Teachers Who had Conducted Special Water Workshops**

| Response | No. | % |
|---|---|---|
| Yes | 39 | .27.5 |
| No | 82 | 57.5 |
| Other | 14 | 9.9 |
| No response | 7 | 4.9 |
| Total | 142 | 100.0 |

**TABLE H**
**Pool Used to Teach Water Exercise***

| Pool | Yes.......... | | No.......... | |
|---|---|---|---|---|
| | No. | % | No. | % |
| City Pool | *2 | 19.0 | 115 | 81.0 |
| Corporate Pool | 5 | 3.5 | 137 | 96.5 |
| Country Club Pool | 7 | 4.9 | 135 | 95.1 |
| Fitness Club Pool | *3 | 22.5 | 110 | 77.5 |
| Neighbor's Pool | 7 | 4.9 | 135 | 95.1 |
| Own Private Pool | 7 | 4.9 | 135 | 95.1 |
| Public School Pool | *14 | 10.6 | 127 | 89.4 |
| YMCA Pool | 51 | 35.9 | 91 | 64.1 |
| YWCA Pool | 12 | 8.5 | 130 | 91.5 |
| Other | 25 | 17.6 | 117 | 82.4 |
| Total | 188 | N/A | 998 | N/A |

**Respondent could identify more than one pool.*

# APPENDIX G

## *Write-in Statements by Respondents for Questions Designating 'Other, specify'*

***Clarification**. The letter Q, followed by a number represents each question that provided space for write-in statements by respondents. The original survey question is shown opposite each Q. Beneath each Q. are the unedited statements written-in by respondents, with the number of respondents adding that statement shown to the immediate right. Statements in summary sections which follow, are reproductions of statements which appear in the body of the text.*

**Q 5.** *What pool do you use to water exercise?*

| | |
|---|---|
| Boy's Club Pool | 7 |
| Civic Center Pool | 1 |
| County Recreation Center Pool | 6 |
| Country Club Pool | 1 |
| Family Center Pool | 1 |
| Hospital Pool | 12 |
| Hospital Wellness Pool | 4 |
| Jewish Community Pool | 9 |
| Mercy Pool Arthritis Foundation | 1 |
| Middle School & High School Pool | 3 |
| Motel Pool | 12 |
| Park District Pool | 1 |
| Private Swim Pool | 1 |
| Recreational Facility Pool | 24 |
| Relative's Pool | 1 |
| Therapeutic Pool | 9 |
| Wellness Center Pool | 2 |
| YMCA | 1 |

**Summary**: Of the pools used for water exercise that were added by respondents, the most frequently identified were: hospital/ wellness/therapeutic pool, recreational facility pools, and motel pools.

**Q 7.** *What is your swimming ability?*

| | |
|---|---|
| Lifeguard | 10 |
| Water Safety Instructor (W.S.I.) | 14 |
| Lifeguard and W.S.I. | 6 |
| Swimming Examination Instructor | 2 |
| Distance swimmer/deep water | 2 |
| Synchronized swimmer | 2 |
| Swimmer, but limited by handicap | 1 |
| Easy, slower style of swimming | 1 |
| In deep water, but not a good swimmer | 1 |
| Novice, but now in deep water | 2 |
| Poor swimmer | 4 |
| Terrified of deep water | 1 |

**Summary - Swimming Ability**. Of the respondents who used the write-in section to identify their swimming ability, 30 were lifeguards and/or water safety instructors, or swimming examination instructors. A total of four individuals reported that the were distance swimmers or synchronized swimmers, with 2 in each category. Of the six who reported poor swimming ability, 2 participated in deep water to water exercise. One respondent reported being terrified of deep water.

**Q 8.** *What flotation devices or other supplies do you use?*

| | |
|---|---|
| *Flotation devices:* | |
| Ball | 22 |
| Beach balls | 7 |
| Life preserver used in the lake | 2 |
| Water wing | 6 |
| Inflatable arm and leg supports | 4 |
| Small inner tube | 8 |
| Pool buoy | 5 |
| Floats on wrists and ankles | 10 |
| Floaties | 16 |
| Pool buoy | 17 |
| *Resistance devices:* | |
| Fluggels (arms and legs) | 21 |
| Rubber bands | 15 |
| Hand paddles | 33 |
| Plastic plates | 13 |
| Plastic hand sized containers | 2 |
| Surgical tubing tied in a circle | 13 |
| Flippers | 2 |
| *Other:* | |
| Rings | 2 |
| Frisbies | 8 |
| Rubber sandals | 1 |

**Summary**. Flotation devices identified by the respondents included: balls; inflatable arm and leg supports; water wings; small inner tubes; pool buoys; floats on wrists and "floaties", and life preservers. Resistance devices added by respondents were fluggels (arms and legs); plastic hand sized containers, such as Cool Whip bowl; hand paddles; plastic plates; surgical tubing tied into a circle; and flippers. Items added of a game nature by respondents included: rings and frisbies. One respondent reported the use of rubber sandals.

**Q 9**. *Which fitness element is emphasized in your water exercise?*

| | |
|---|---|
| Joint effort for arthritis | 2 |
| Combination: cardio, flexibility, toning | 6 |

**Q14**. *What are your major reasons for exercising in the water?*

| | |
|---|---|
| Arthritis | 42 |
| Strengthen back | 11 |
| Strengthen broken leg | 2 |
| To reduce blood pressure | 2 |
| Stress reducer/relaxation | 7 |
| Exercise joints of the body | 4 |
| Less shock on joints in water exercise | 8 |
| Mastectomy, causing edema of left hand | 1 |
| Disc problems | 1 |
| To flatten stomach | 1 |
| Easier than land aerobics; more enjoyable and effective | 3 |
| I like the water | 4 |
| I enjoy it | 10 |
| Makes me feet great | 4 |
| My ability to move is improved in water | 1 |
| Arthritis, broken shoulders and injury to vertebrae | 1 |

**Q 15.** *Do you currently have any of the physical conditions or problems shown above?*

| | |
|---|---|
| Bad back | 16 |
| Lower back problem | 8 |
| Ruptured disc in lower back | 6 |
| Arthritis | 5 |
| Disc problem | 5 |
| Scoliosis | 5 |
| Angina | 4 |
| Back back and neck | 4 |
| Sciatic muscle spasms/lower back | 2 |
| High cholestrol | 2 |
| Nerve damage to feet | 2 |
| Asctic stenosis and insufficiency | 2 |
| Headaches | 2 |
| Chronic migraine | 2 |
| Broken ribs | 2 |
| Breast cancer | 2 |
| Stroke | 2 |
| Bunions | 2 |
| Bad cartilage in knees | 2 |
| Partially herniated disc | 1 |
| Medical recommendation for knees, hernia and arthritis | 1 |

**Summary.** The most commonly cited physical conditions or problem added by respondents in the write-in section were: back, neck or disc problems. Other physical conditions or problems included: high cholesterol; breast cancer; stroke.

**Q 16.** *What difficulty have you experienced with water exercise?*

| | |
|---|---|
| Some breathlessness | 8 |
| Cramps at times | 7 |
| Sometimes fatigued | 7 |
| Legs ache | 6 |
| Muscle soreness | 6 |
| Soreness in foot | 5 |
| Feet cramping | 4 |
| Bad elbow; usually hurts by end of class | 2 |
| Limited arm range | 2 |
| Injured toes from jumping | 2 |
| Some discomfort in feet | 2 |
| Getting pulse down | 1 |
| Sprained lower back mucsles | 1 |

**Summary.** Write-in comments, to identify diffculty participants had experienced with water exercise included: some breathlessness; cramps at times; sometimes fatigued; muscle soreness; discomfort in feet; injured toes from jumping.

**Q 20.** *In general, what major benefits have you experienced from water exercise?*

| | |
|---|---|
| Improved muscular strength and endurance | 9 |
| Reduced back pain and stiffness | 8 |
| Less arthritic pain | 8 |
| Relieved stress | 7 |
| Increased flexibility in back | 5 |
| Much improvement in pain in back and neck | 4 |
| Blood pressure has gone down | 3 |
| Helps with arthritis | 2 |
| My arthritis feels like it is gone | 2 |
| Overcame early childhood fear of water | 1 |
| Helped my breathing when started a running program | 1 |
| Motivation to exercise at home | 1 |

**Summary**. Write-in comments to identify subjects' perceived major benefits from water exercise included: improved muscular strength and endurance; reduced blood pressure and stress; overcoming an early childhood fear of water.

# APPENDIX H

## Statements Written on the Survey Booklet by Respondents

Unedited, written comments by respondents about water exercise, are reported in the seven sections. These are comments related to:

I. Water Exercise
II. Age
III. Teachers and/or Programs
IV. Physical Conditions and Problems
V. Scheduling Water Exercise Classes
VI. Social Aspects
VII. Other

Statements which overlapped one or more sections were, of necessity, placed in one section. Age notations in brackets were added by the researchers.

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### I. Water Exercise

1. I am amazed at the positive physiological results in three, 8 week, professionally taught fitness classes. Water exercise is destined to be the exercise of the 90's.
2. I feel water exercise is the best physical exercise. I have felt less stressful.
3. Not being a very flexible person, floor exercises just don't do it for me. I enjoy the relaxed motion in water and I get the full benefit from this exercise.
4. I drive seven miles plus, 3 days a week for this class, which entails 1 3/4 hours each day. I would give it up if I didn't feel the benefits. Water Exercise takes the place for me of swimming during the winter months, since we keep our pool open only four months.
5. I think water exercise is a great sport and that more people would participate in this sport if they knew more about it. For instance, you do not need to have a lot of swimming background, or even know how to swim.
6. I love my fluggeling!
7. I thoroughly enjoy my aquarobics class and wouldn't know what to do without it.
8. I have always enjoyed being involved in water sports such as snorkeling and swimming. I find that water exercise is enjoyable, beneficial and also relaxing.
9. Water aerobics is wonderful! I can move body parts in the water that I can't move on land. I would like to take "year around" but can only take when it is offered at [ ].
10. I think it is the greatest thing that ever happened.
11. Exercising in the water does not leave you with stiff, sore muscles the next day. The water provides resistance but also allows full range of motion of the joints. But, best of all, you end up refreshed instead of "sweaty."
12. Water aerobics is the only exercise I have ever enjoyed.
13. Water exercise is a fantastic way of getting the correct exercise I need. I can not do floor aerobics because of my knee so water exercise is a perfect answer. It also helps to tone muscles and you feel good after a session. Also helps keep stomach muscles tight. You do need a good instructor and good music. The pace must be fast and even to get your heart rate up and you must really work to your maximum, no time for chatting. I hope I can be in the classes when I'm 90.

14. Any form of exericse, in the past, has not been something that I would look forward to doing. Aquacize is a very uplifting and rewarding experience for me and I look forward to a continuance of this exercise.

15. I thoroughly enjoy fluggel aerobics. I was in dance aerobics for almost six years and changed to water aerobics. It is a marvelous substitute, no pounding, no possibility of ever injuring yourself of feeling one iota of pain. The ability to make certain movements in water with fluggels, which could never be done by myself out-of-water, especially the "ballerina-at-the-bar leg movements."

16. Water exercise is the most enjoyable form of aerobic exercise that I've ever experienced. Thank you for giving me the opportunity to participate in this survey.

17. I have been involved over the past years in track, cheerleading, tennis and land aerobics. Never before have I found an exercise that I truly enjoyed. I find water exercise relaxing and a stress reducer and it has made me feel so good and look so good!. Hooray for water aerobics.

18. I feel my health and well being have improved. My lower back and hips are not as stiff as they were. I intend to continue the exercises as long as I am physically able.

19. I have been active physically at the YMCA for about thirty years. I can't say enough about our Aqua-aerobics class! I feel it gives me effective exercise. There is much benefit from the class for me. Water resistance to the body, but no damaging pressure to joints and muscles.

20. One of the most enjoyable and satisfying activities I've ever participated in. A wonderful instructress has added to the pleasure of water exercising.

21. Water exercise is one of the best things I have done for myself.

22. I attend water exercise faithfully. It does me a lot of good physically and morally. I wish I had known about it sooner.

23. I swim exercise in the warm therapeutic pool and it has been so good to keep me mobile.

24. I particularly enjoy water exercise because the water "cushions" the exercise and I never feel sore or as if I've pulled a muscle.

25. Good luck with your research. What I enjoy about water aerobics is the resistance of the water. I have difficulty getting my heart rate up to 50-70 of maximum, but feel aerobically "worked out" nonetheless. Due to a combination of water and floor aerobics, and walking, but mostly water aerobics, I have lost seventeen pounds in 10 weeks at a very safe rate. Water aerobics is my "exercise of choice."

26. I have noticed a gradual decrease in weight since I began water exercise twice weekly. When I participated only once a week, I didn't notice any weight loss, just toning. This winter I did not "suffer from my usual weight gain of 5 pounds."

27. Water exercise helped me to decrease my appetite which helped me stay on my diet. I thoroughly enjoy the water exercise class. It also really helped me with my arthritis.

28. Water exercise is excellent for all around toning and physical fitness.

29. No matter how much I water exercise, my pulse never goes over 90. Probably because of my pressure medication.

30. I look forward to my aquarobics class! Excellent relaxation and general toning. Have noticed improvement in my general physical condition, blood pressure, and outlook overall. Walk three to six miles per day, almost every day. Also do some floor exercises (15 to 20 minutes) to keep my back in good shape.

31. Sure feel the loss when I am unable to attend class. Love this form of exercise!

32. Water aerobics is great. You feel more relaxed after water aerobics when compared to land aerobics.

33. Water exercise is a lot of fun and good exercise, but because I have very fair skin, I have to quit when it moves outside in the sun.

34. I tried land exercise aerobics but couldn't keep up. The water exercise is much better. I lost seventy-five pounds in 18 months using this form. It's also a plus in controlling migraines as part of a relaxation component, i.e., bio-feedback relaxation therapy.

35. I love it! Changed me from a couch potato to a low level of exercising.

36. Aerobic exercises in the pool have the added benefit of "soft impact."

37. Tried regular aerobics first, but it was hard on my joints, and I'm not wild about sweating! Aquacises has proven to be fun, affordable, and I can do it all year long. My rom has improved "all over", particularly my hips.

38. I would like a more vigorous water exercise workout done to taped music.

39. In the winter, rather than walk, water exercising is a sane way to exercise.

40. I love it! It is the only exercise program I've stayed in and felt this good about. Land aerobics classes always left me exhausted and often feeling rather defeated. This invigorates me and I've seen terrific results! I work very hard in class and really enjoy it.

41. I find it possible to do much more strenuous exercise in water than in a regular land exercise class. I enjoy it very much.

42. I am a 38 year old registered nurse who quit my job due to burnout. Water exercise has been very important to me since I left my job for several reasons. First, exercise helps maintain a healthy body; second, water is very soothing and healing to body and mind; and third, the low impact of water aerobics is more appealing to me than the hard floor.

43. Water exercise is fantastic! It's like exercise and physical therapy at the same time. I think it should be stressed more than land aerobics; easier on your joints.

44. I have found water exercise the most beneficial for me because I truly enjoy it. Therefore I try to make it to all of my classes to get the full benefit of the class. My body loves it and so does my mind.

45. I can feel the challenge in my legs. I don't think I have lost inches in my waist and stomach. My back bothers me so water exercise is good for it.

46. Water exercise is very relaxing for me. After class is over, I have a feeling of well being. I haven't lost any weight yet. I think the water exercise gives one a better appetite. I know my body has become stronger, since I first started classes! I enjoy water exercise very much!

47. In the past twenty years I have participated in 2 different programs of aquacize (water exercise). One class for 5 years and one for 3 years. Each of them were at Y.W.C.A.'s. They were both of the exercise routine type class, set to music. The class I'm in now is very different and just became available in January 1988.

48. Water exercise is wonderful and essential for people with joint problems as there is no other way many can exercise. I am thankful to have the opportunity to participate and have an outstanding instructor named [____].

49. Fluggeling has taken the place of all my land aerobics except for walking. It has been the best, most enjoyable means to tone muscles. It is low-impact and more beneficial than what was happening for me in land aerobics. I'm quite flexible but was beginning to feel arthritic! Sometimes I swim a mile two to 3 times a week with

flippers at a pool at the Handicapped Center, but only if I haven't been able to fluggle that week.

50. I love it. It's the best all round exercise I've ever undertaken and I will continue with it as long as possible. (Age bracket: 40-59 years.)

51. Water exercise is the best thing I've done for myself. This coming Fall, it will be 3 years of it for me. Not only is it beneficial, but also a lot of fun! I intend to continue with it indefinitely. It has made me feel better, and look better.

52. This kind of exercise has been extremely beneficial to me. I have dropped to once a week, but intend to go back to twice a week soon. I felt better when I went twice a week.

53. This is my first experience with water exercising and I love it. I intend to keep it up. Thank you for giving me the opportunity to participate in your survey.

54. After a day's work, I find water aerobics to be very relaxing—can just feel the tension floating away.

55. I am not able to say exactly what benefits I derive. I like to do it and feel good afterward.

56. Though I have been lap swimming regularly for the past four years, I have found that since I started the water aerobics classes 6 months ago, my energy level has increased dramatically. Also, I have a better outlook. My mother and grandmother both have or had arthritis in their knees. I am using water aerobics as a preventive medicine. At age 46 I don't have a knee problem, but my sister who is 3 years older, does and does not do water exercise.

57. In NE., I cycle during the warmer months. I also ride the lifecycle at my health club once or twice a week. Having a marketing background, I feel your survey is comprehensive and well planned. I have seen rapid physical and mental improvements since beginning this program. Please include me in any future health demo's you conduct. P.S. I'm recovering from mono and found regular aerobics too exhausting. The aqua routine allows me to exercise without total exhaustion.

58. Water exercise has brought me from a basically sedentary lifestyle to a fairly active one. I've tried many forms of exercise and water seems to provide optimum results. It is most important in my life. It's wonderful. Further, I think the key to success of water exercise is its natural resistance.

59. It's a great way to stay in shape safely and enjoyably.

60. I walk quite a bit—a couple of times a week. I do enjoy the water exercise, which has helped me a lot. I am more flexible than ever before. I only go twice a week and would like to go 3 times a week, if I can fit it into my schedule.

61. Dr. Midtlyng. This is the first time I've ever taken aqua-aerobics. It's the greatest thing I have ever experienced. We have so much fun. I'm getting all the benefits out of it and love the water. I have a pool at home. Is there any way you could send me an exercise program so I can do it in my pool while I'm not doing the exercises at the [____]?

62. I enjoy it .

## II. Age

1. I am 11 years old and I am the youngest aqua-flexer in my group.
2. I would highly recommend water exercise for all age groups. It has been the best exercise program I have found. I have tried jogging (and did jog everyday for several years) which left my ankles very weak. Aerobics, which I did for a year, also bothered my ankles. I still do some aerobics without the jumping and running around once a week. Water exercise does not bother my ankles and I can jog and jump without any side effects. A very good way for people to enjoy exercising.
3. I have had a whiplash and therapy hasn't helped. I decided to quit smoking and exercise in a pool. I am 69 years of age and pool time and exercises are helping me a great deal.
4. Great! I don't have all the aches and pains of others my age (52).
5. For my age group, water exercise is far superior to any other form of exercise because it is easier on the joints. (Age bracket: 60 yrs. & up).
6. About a year after retirement, my doctor recommended a part-time job; then swimming; then exercising. For five years I followed his advice until I accidentally suffered a severe neck injury. Then I walked for exercise for about five and one-half years. After that I began swimming and water aerobics, which has been very good for me with my arthritis. My age is now 78 years and 4 months.
7. I feel strongly that the water fitness program is very beneficial to me. It relaxes me and gives me a feeling of well-being. I am 75 years old and blessed with good health. I hope and believe that the water fitness program will help me to continue to enjoy life to the fullest.
8. At 80 years, I feel that my exercise is limited but for my age, I am doing what I feel is for me.
9. Retired because of arthritis of the knees. Walked three miles per day, 5-6 days a week until November. With cold weather coming I decided to try water exercises. Prior to starting this exercise, my sleep was interrupted three to four times per night with severe muscle aches in legs and thighs. These have practically dissappeared. I can attribute this relief to nothing but water exercise.
10. Dear Dr. Joanna Midtlyng. Before I started water exercises in the senior citizen classes at the YWCA in [____], I had belonged to health spas for twenty years. It would take more paper than this sheet affords to tell you how much my health improved at the YWCA. After a short time I went from the senior group to the advanced water aerobics. My main instructor has been [____]. Every employee has been a caring person. Thanks from a sixty year and up person.
11. Water exercise is one of the best things that could happen to a person my age (75).
12. My doctor advised me to stay active. I started with land aerobics but could not stand the pain and had trouble with tendons becoming very sore and had tendon damage to one knee. One semester, when I felt able, I started water aerobics for one semester. At the end of the semester I had very little pain. Second semester I started land aerobics, and have worked up to high impact land aerobics. I did the land aerobics after an hour of water aerobics. We have half an hour between classes. I had x-rays six weeks ago and there are many spurs on the spine and I have 3 discs missing in the lower spine. I would not believe it until I was shown the x-rays for I do not have the

pain that usually accompanies this problem. Thank God for water aerobics. I do not take pain medicine. (Age bracket: 40-59 yrs.)

13. Water exercise is the best exercise for women starting 30 years and up. I am a pupil for life in water exercise.

14. Water exercise has lowered my blood pressure, helped reduce my weight, built my body, and tightened my muscles. There is no stiffness in my muscles from this exercise, and it has even helped my skin. I have been in [____] water exercise class for five years and wouldn't miss it. I also am a swimmer and have increased my distance swims from about three or 4, to ten to 20 times across the pool. (Age bracket: 60 yrs. and up).

15. Before I retired, I walked all day on my job. After retirement, I knew that I had to do something to keep physically fit so I joined the YMCA group called "The Geritol Kids" in [____]. It is a wonderful way to keep fit. We do aerobics twice a week and regular water exercises twice a week. Thanks to my instructors [____ & ____], I am in great shape. (Age bracket: 60 yrs and up).

16. I have benefited enormously water watercizes, both physically and mentally, I am addicted to my classes. I am 72 and hope to find myself exercising at 82. We also have an excellent young instructor.

17. I think water exercise is great. Everyone past 40 should be in an exercise program. I wish we had a class for men. I'm 70 years old and this is great for my old bones.

18. This is the most wonderful way to exercise after 40. No strain on joints. Also, we have begun a men's water exercise class and they are doing negative weight training with pull buoys that have been very beneficial.

19. I will be 75 years old this March. I'm thankful to have the opportunity to take water aerobics and swimming. Keeps me agile and able to walk twice a week. I think this is a wonderful exercise for senior citizens.

20. I started water exercise in July I987, and now, after 7 months I feel stronger than I have in decades. Actually, I never would have believed that at my age (77), I could feel stronger and more vigorous than I did at 50 ot 60. My arms and shoulders feel stronger than in I944 when I had intensive infantry training in a heavy weapons company at Camp Blanding, Florida. Even sitting in a chair or lying in a bed, I can tense my muscles and feel stronger than I have in decades. It is almost miraculous. I probably would never have started if it I had not been so bored waiting while my wife engaged in exercises that I thought I might as well be doing the same thing. Wrong reasons, perhaps, but great results. Weight, 172, height, 6'1".

21. At this stage of my life, 40-59 yr. bracket, it is very uncomfortable to do land aerobics. I find the water much better for me in every way.

22. I'm 54 years old. After having a knee injury, I could no longer do floor aerobics. Water aerobics has been wonderful, not only for my physical well being, but psychologically as well. I also have a weak back and stretching exercises have helped tremendously. We have had 3 instructors since I started water exercise. The one we have now is truly exceptional.

23. Water exercise has helped me physically and mentally. The exercise keeps my body moving and the counting and instruction helps keep my mind alert (I hope). (Age bracket: 60 yrs.and up).

24. I broke my right hip in I979 and a steel ball was put in place. My body rejected it. I had a Teflon hip put in on election day I980 and it's great. First I just did exercises and then in I981 I learned to swim and went back to exercises and swimming soon after my

second operation with no adverse consequences. In March l985, I had a mastectomy and I feel that the water exercises and swimming made my arm more mobile. I was back swimming in 6 months. I am 73 years young.

25. I cannot take land aerobics because of leg and back problems, but since taking advanced aquarobics both conditions are better. Also, I have been successful in losing 20 pounds.
26. I absolutely love water aerobics. I have forty-five minutes to an hour to myself at least 2 times per week. I rarely miss a session. I feel it is necessary in monitoring a health body. It is a necessity for me if I want to stay free of muscular back pain due to scoliosis. I have tried regular land aerobics and was pooped when the session was over. With water aerobics I seem to have extra energy when the session is over. I have always loved any kind of water activity.
27. At age 83, arthritic and recovering from total hip replacement, I credit the University of [____] superior water exercise program with keeping me fit, mobile and useful, and proud of myself. I recommend it without qualification.

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## III. Water Exercise Teachers and Programs

1. We have a new teacher and have not done too much yet.
2. Water exercise is a fun and easy way to exercise. We have an excellent teacher [_____].
3. Our instructor has a master's degree in physical education.
4. My motivation has been to decrease loss of muscle strength and improve flexibility and the latter is working. The former is not and I develop back spasms if I raise my arms above my head vigorously. Some of our teachers are helpful. Others seem ignorant of adaptations of exercises for those of us in class who require exceptions. This is frustrating and not resolved.
5. Water aerobics is "top of the line" for fitness, especially when you have a qualified instructor such as [______].
6. I think that our water exercise program should have a warm up session and a cool down session. I also would enjoy some music. Last year our instructor had music but none this year. Exercise seems to go easier with music.
7. I believe we should have warm ups and cool downs before and after class, and more variety of exercises.
8. I really enjoy my water exercise classes. Our teachers are very qualified. I have always done floor exercises and enjoyed them, but they seem to make my back (lower) hurt and the water exercises do not.
9. The instructors are top notch, not only in knowledge of subject and performance, but also are caring, helpful and delightful people who make the class fun, not work.
10. Our teacher at the YMCA is excellent. She explains what the various exercises do for the body. The comraderie in the class is important to me, especially since the children have grown and left home. My husband comes to classes three times a week and the exercises keep him flexible too.
11. We have a very knowledgeable caring instructor named [______].
12. I think instructors should have some knowledge of physical therapy.

13. I used to teach land exercises (aerobics) and gymnastics for over 10 years, and I had sore muscles all the time. For the last five years, I have taught waterobics classes (vigorously) at least ten times a week for 45-60 minutes each. I lost inches, weight and my body is firm, but most important, I was not sore after each class. Students tell me all the time when they first started my program (doctor's suggestion due to elevated or high blood pressure) that their blood pressure was lower or even back to normal after one to two, 6-8 week sessions.

14. I have the feeling that the instructor is not well prepared (not enough background knowledge) to give a proper workout. Instructors should be well qualified with background requirements met, not people who are selected merely because they are available at the required time.

15. We in Hawaii are blessed with beautiful weather most of the year and with a mayor and city government who realize the importance of preventive medicine and of staying healthy through exercise. They have provided us with lovely pools and excellent staffs. At the moment we are searching for a teacher, ours having been promoted, and it is discouraging to learn how few people qualify or are willing to teach. I sincerely hope that your school is training young people to know the importance of exercise to the over 40 set, and are aware that water exercise is the safest and most productive way to exercise.

16. I enjoy the class. I teach the class twice a week for a 45 minute class. I have done water classes on and off for about 4 years. I also taught aerobics until a cycling accident, which injuried my knee and stopped me. So I do this to keep my tone and continue my exercise.

17. Water exercise is one of the greatest things that has happened to me. My teacher, [____], is great and knows what she is doing. This stuff puts hussle in my bussle.

18. I can't say enough about the aqua-flex program given at my club. The instructors are excellent and the program offers classes daily. I love the aqua rhythm classes which are aerobics done to music. I am in the water taking classes four or 5 times per week and the only complaint I have is the effect of the chlorine and chemicals on my hair. I am hooked on the program and love it!

19. Please make sure to inform the people in charge of teaching the classes that it is very important to warm-up before beginning to exercise, and the heart rate monitoring is a must! You have a lot of old people in these classes. Sorry, senior citizens.

20. Our instructor is super. We exercise to music and she provides a variety of routines. She gets pre-recorded tapes with routines when she can find them but they are rare and scarce. It would be wonderful if we could have more routines set to up-beat music. Variety of different and new exercises needs to be provided. I hope you will share a library of resources with the ladies in Oklahoma who are in your survey. Good luck!

21. Not enough pools or instructors available at a reasonable price.

22. Believe that posture should receive more stress, more frequently during exercise. Also, more individual attention should be given to improper techniques.

23. I thoroughly enjoy water exercises. We have a good teacher with a wonderful personality and we all enjoy ourselves, along with knowing that we are doing something good for ourselves.

24. I find aquacize a most enjoyable way to work on muscular endurance and joint flexibility.

25. I think it's great. You can do so much more (different exercises) in the water

that you can't do on land because the water holds you up. It helps you to kick higher and in different ways, and you can twist and bicycle ride in all directions, which you could never do on land. It is good for the waistline.

26. Sorry I was so late in discovering water exercises. I swim regularly in an outdoor pool all summer but generally do not enjoy lap swimming in an indoor pool.

27. It's great fun and hard work. The music is sometimes too loud to hear the instructor, but we manage.

28. Excellent activity. Great benefits!

29. I thoroughly enjoy water aerobics. I'm glad I belong to a club [____] where such a good program is available. Also, I'm glad you're doing this survey.

30. I believe that regular swimming and water walking in the pool has kept me out of a wheelchair.

31. I really enjoy my aqua-aerobics class and am optimistic that it can become a long term form of exercise for me.

32. We have many groups that use our pool, and ours is a mixed group. I know it's hard to keep the water warm enough for all but it could be at least 82 or 83 degrees most of the time. Our best instructor who was excellent went back to school. She understood why we were there. Since I have been in the program my legs and knees don't bother me as much. Some of the arm exercises have not helped my right arm and I still have pains down into my hand.

33. I instruct the water aerobic exercises classes at the [____] YMCA. I enjoy it. I use music to order the exercises, and the students seem to enjoy this. Thanks for including us in this area of importance.

## IV. Physical Conditions and Problems

1. I have had a great deal of stress. This has helped me more than anything, not to mention improvement in arthritis.

2. I've felt better and better since starting to water exercise and shall continue as long as possible.

3. This has been the answer to an exercise program that I can really participate in. Since my surgery, I have been unable to do extensive walking, etc. I am unable to squat, stoop, etc., that is involved in land exercise.

4. I feel water exercise is the best physical exercise I have done. I've felt less stressful and my arthritic feet feel much better.

5. Water exercise has helped my arthritis so much! I have less pain, can walk better, get up and down with no pain and have more strength in my legs, arms and neck. As long as I take my exercise I do not have to take pain pills and I feel better.

6. I had to have knee surgery after 5 years of floor aerobics. The water exercises are far more enjoyable and are much less stressful on bone structure and joints.

7. I had a time when my arthritis was so bad. I could not move a year ago. Water exercise gave me strength and movement. I have been exercising since I was 45. I am 65 now and I plan to keep on. It makes me feel better all round. PS: I played volleyball for 15 years; tennis for 10 years; now, it's water exercise.

8. Water exercises have helped me live with two back surgeries. I am much improved since beginning to go to water exercise classes in I984. I think they are the answer, especially if you have a health problem.

9. I suffered with arthritis of the spine for nine years. I finally started pool exercise one and a half years ago and it cut my pain down and lowered my blood pressure. I swear by this exercise.

10. Water aerobics is one of the few exercise programs that I can do as an asthmatic.

11. I have taken numerous jazzerobic type classes and play volleyball, but tendonitis in my shoulders has bothered me recently. Aquacize is great for getting me into exercise and it is relaxing, stimulating and fun.

12. Exercise without impact is wonderful for arthritis patients.

13. Water exercise can be a challenging aerobic exercise if the instructor and yourself really push and make it so. Last year I took water classes and found them to be a very good workout. However, with the change of instructor this year, I constantly monitor to insure my pulse rate stays 140 or under due to my pregnancy. The point is, it can be what you make it.

14. I had cancer in my left thigh. The tumor was removed along with the abductor muscle and lymph modes. After surgery, I took up swimming in our YWCA Therapeutic Pool in an effort to strengthen my left leg. In the last year I switched to Water Aerobics at the urging of my husband. It is fun doing the exercises with others.

15. Water exercise in a heated pool has helped my arthritic condition.

16. Only exercise I can do due to deep vein phlebitis. Only one that does not cause much pain.

17. Water exercise is very important for me, because it is the only good aerobic exercise my back can tolerate. I am trying to find time to do it more often.

18. I am well pleased with the program put on by the [______] YWCA. We use a heated therapeutic pool, and I find it an aid to performance and soothing to muscles and joints. The staff is qualified and dedicated. I intend to continue water aerobics and even use the techniques when I travel.

19. I prefer water exercise to land exercise because of arthritis problems, which make it difficult for me to exercise on land. I do walk every day. Water aerobics exercises a person's body partially hidden by water, therefore, there is less of a feeling of competition with one's neighbor or embarrassment of one's being less physically agile than other class members.

20. Water exercise has really helped my knee recover from surgery for torn ligaments and cartilage and dislocated knee cap.

21. Water exercise was the answer to my back problem.

22. Water exercise has been great for me. I have a bad back so I can't jog or go to an aerobic class. But water aerobics allows me to get needed exericse, plus it is fun. Good luck with your survey!

23. I am considered physically impaired by most people. At age 10, I had multiply cancer myosarcoma surgeries on one hip and surgery on the opposite knee to retard growth following x-ray treatment. It was recommended that I no longer run, jump or participate in any physical activities. At age 37, with arthritis in all body joints, and increased pain, I began water exercise classes twice weekly. Since I have increased my water exercise to three to four times weekly, the result is limited arthritic pain, increased muscle strength in one leg that I used to lift regularly. Now, I'm able to lift my leg by itself. I will never be a super athlete, but now am able to jog in a pool for twenty-five minutes daily, which I would never consider doing on land. It's one of the best things to happen in my life.

24. I am asthmatic and can go through an hour of exercise in the heated pool at [____], I stand in deep water for exer-

cise and was taught in this program to swim at age seventy. Since I joined this class six years ago, the class is now too crowded for swimming and it is not included. However, in between water exercise classes, I get some swimming practice. Note: water cannot be cold.

25. Water exercise is a great relaxer and enables people with stiff joints to loosen up. We have quite a few people in our class who have had some surgery on joints, as well as heart surgery.

26. Aqua exercise has been a real plus in keeping my arthritic joints moving. I can tell a noticeable difference.

27. In January of 1980, I was in a trucking accident that left me paralized from the chest down. I had no feeling for about three months. As the swelling in the spinal cord area went down, feeling did return. I had to relearn crawling, standing and walking again. I spent almost three years in a brace that held my right knee from bending. I now walk with no braces but have to use two canes for balance. Land aerobics is out of the question for me because of the canes. Water, however, supports my body and allows me freedom of movement. It also helps my cardiorespiratory system. Allows me to attempt movement of my right leg in exercises that spa machines can not. In August of 1987, I was unable to extend my right leg below the knee. In the water I am able to exercise the muscles to move that part of the leg. Not only am I getting exercise but building strength as well. I would go into more explanation of my injury and rehabilitation later if you need it or would be interested.

28. I had a full hip replacement on June 2, 1987, and was back in class August 1, four days a week, October 1 to December 1. I walk two days for 2 miles, and now am doing four days, 3 miles a day. I am overweight. Water exercise has helped me.

29. I never felt as good and have decided that I shall enroll in aquacise classes as long as possible. I have been able to quit taking my arthritis medicine and am much more limber.

30. Our water exercise class is a low key way of keeping fit. My doctor has recommended that my heart beat (pulse) be kept under 100, because of a potential high risk due to blood pressure. The water exercise class provides an easy way to do this, besides being fun. We have a fun teacher. Also the group support is encouragng. I used to do exercise equpment and other heavy aerobic exercises with a heart beat of 130. Now with my slight physical limitations, water exercise fills the gap.

31. Best treatment ever I have experienced for arthritis and post-operative abdominal pains.

32. The blood circulation in my legs has improved. Before I went to the Hydro-Aerobics class, my feet and legs fell asleep when I sat in one place for a period of time. Now, they seldom fall asleep.

33. Without water exercise, I think I would be a cripple, because of my scoliosis, leg and hip problems. I was able to do land exercise daily, but found it boring and painful. The doctor says that I am doing great with water exercise.

34. Because I was over 100 pounds overweight, the normal aerobic dance type class was impossible. I also have bad vericose veins, and the pounding of my feet on a regular floor would be painful. I've been water exercising for one and one-half years. I have been dieting for the past six months and have lost about 50 pounds. But even before I lost this weight, I found that I could climb stairs and not be gasping for breath when I got to the top. I have stayed with this exercise program for the longest period in my life, and hope to continue as long as possible.

35. I am enthusiastic about water exercise and wish it were available to more

people at an affordable cost. I feel it has been so instrumental in relieving pain from arthritis, siatica, etc., and have seen people who were using canes to walk, and who after 6 months or so, were able to walk normally, that this (water exercise) should be prescribed by doctors and covered by medical insurance, if the need is serious enough. Warm water pools are far more effective in my opinion, as I used a colder pool in another area, before moving here. The colder water was not as beneficial as warmer water.

36. Water exercise has greatly helped my arthritic condition and I am very thankful for the opportunity to participate.
37. Because of rheumatoid arthritis, I was relatively limited in mobile activity and started with a mild exercise group called "Aqua-Fit." Moved to "Aqua-Aim" and am now in "Aqua-Aerobics." It is definitely stressed that we do exercise as our own bodies are able, that is, "listen to your body!"
38. I enjoy water exercise very much. I had a heart attack 2 years ago and had a cardiac arrest. My doctor suggested the aqua-robics as a good exercise to improve my cardiovascular system. It has helped me immeasurably. I have been seven semesters of aqua-robics, summers and winters, and really have received good benefits from it.
39. I cannot say enough about watercizes. I injured my back over one year ago and an operation was the first recommendation. I declined. I had ruptured a back disc and was not even able to walk. With rest, my condition improved somewhat. Water exercise has strengthened my muscles so that the pain has definitely decreased. My mental attitude from being in this program has definitely contributed to my recovery along with exercise. I cannot praise it enough. The water exercise that we call aquanetics in our area are invaluable to me. I have a pacemaker and have had a cardiac double bypass and am just recovering from a laminectomy. All my doctors recommended the aquanetics highly and I have found that it is really helping me. Our instructors are young, enthusiastic P.E. majors from our local college. They keep us moving and are really nice kids. While on vacation on South Lake Tahoe, we are participating every day, at a cost of only $1.00 per session. At home in [____], it is scheduled 3 days a week and costs $1.00 each time.
41. I found water exercising extremely helpful in regaining range of motion in my knee. I tore ligaments in a skiing accident in I984 and had surgery on it twice. There was little significant improvement (even from physical therapy), until I took up water exercise. Although I still cannot bend it or straighten the knee completely, it is definitely improved.
42. Water exercise has been a Godsend to me. Child rearing years and care of a mother-in-law kept me at home too long. I gained much weight and grew flabby. Then I got a pinched nerve in my lower back , spurs in heel, tendonitis in knee. All of these problems have disappeared or are under control. The more consistent I am in water, exercising regularly, the more comfortable and mobile I am. ( Age 40-59 years.)
43. I have arthritis (knees) and have trouble with floor exercise and biking. I wouldn't trade water aerobics for anything. For me that's all there is except walking and in Idaho we don't have a lot of good weather. Our spa class is 3 days a week for I hour with warm-up, twenty minutes of aerobics, cool down and stretches. I take the 4:30 p.m. class right after work, just before going home for supper. I've lost inches, and weight, and have gained clean fun and meet good people of all kinds.
44. Water exercise has been extremely valuable to my recovery from total hip surgery.

45. My weight is 135. Would undoubtedly be 235 without water exercises. Physical well being is secondary only to mental relaxation and well being. These and the social aspect are equally important.

46. Prior to enrollment in the [____] program, my wife was suffering from a very painful foot ailment. At the doctor's suggestion we both joined the water program. After a few weeks she was able to walk for as much as 20 minutes relatively free from pain. She was unable to walk or stand without help for more than a minute or so before the aqua-exercise class. There have been other benefits I believe. We are 60 years plus.

47. I initially exercised in the water on my own. After hip(s) surgeries I found out about aquacize during a demonstration at [____] college. It has helped me with flexibility, cardiovascular endurance and muscle tone and has been a very sociable and fun-filled time.

49. I strongly believe that water aerobics is the best type of aerobics I've every done. Due to a back injury, I changed from land to water aerobics. I seldom have back pains from water aerobics. (I do feel that flutter kicking on the side of the pool does hurt my back). The instructor, who acts like she is having fun, helps me enjoy the workout.

50. I fully enjoy the aquatic exercise I am in and also the fact that it is in warm water (for those of us who may have some arthritis). I used to swim laps (front crawl only) before having a masectomy. While I enjoyed the lap swimming, I sometimes had sore shoulders afterward. After the surgery, I started the water exercise and really like it and like the way I feel after a workout. As a former girls physical education instructor, I am a firm believer in exercise and try not to become lax about myself. I hope you have a good response from the survey, and I will be anxious to near the results.

51. As age increased, so did muscle and joint stiffness. My swimming exercise class, twice a week, has been so beneficial in easing this condition. I have a congenital hip dislocation which throws my spine out of alignment. Exercise swimming has eased all stiffness in my back, which enables me to stand and walk longer periods of time. It is wonderful!

52. After surgery, my doctor recommended that I continue to do exercises the rest of my life, especially weight bearing types. In aerobics he felt the water exercise would be a better way to start and work into land aerobics. So far I feel the water workout is very good as I feel it in my muscles afterward. I do also use nautilus machines. I played tennis and did cross-country skiing before my accident so I am used to vigorous exercise and looking forward to being able to get back to these types of activities.

## V. Scheduling Water Exercise Classes

1. Although I have been water exercising only six weeks, I really enjoy it. I wish the YMCA would schedule the class three times per week instead of 2. I feel I would have better results with a more frequent schedule.

2. I participate in water exercise three times a week for 1 hour during the summer months. Due to my work schedule and fact that classes are offered only two evenings a week, I participate only twice weekly, the

other nine months. I love this form of exercise. It is fun, good for me, and does not hurt my bad knee.

3. I have done land aerobics for several years. They are definitely more stressful on your legs. Water is not. I do feel, however, as far as weight loss, that I lost more during land aerobics! This may be due to the fact that I went 3 times a week to land aerobics. The water exercise class I presently attend is only 2 nights a week. I would enjoy Saturday a.m. classes!.
4. I am able to enjoy water exercise because I have access to a pool during my lunch break. The program is specifically designed and geared within this limited time period. It works great! I now feel more energetic in the afternoons and am able to get past a late afternoon slump with productive work output.
5. At the [____] campus, they offered a "Aqua-noon' program for the first time, last Fall. I enjoy it a lot. I never liked regular exercises - calesthenics, or aerobics. I do enjoy this.
6. City budget and cut backs forced two times a week instead of 3 times. Hospitals charge $50.00 for six weeks. City is free. Sedentary life has increased my weight from 200 to 220 pounds, with only two meals a day. No salt, no red meat (fat), on Atkin diet. Can't feel pulse. Pipe smoker, case of beer a week.
7. I really enjoy my water exercises four days a week.
8. I would like to do this class three or 4 times per week, but it is only offered one day a week.
9. My water exercise class meets only twice weekly. Would love to go three, possibly 4 times. Feel the overall benefit would be greater. Also, information about water exercise should be made available to the general public, especially pregnant women. I first got involved when I was pregnant with my first child, about 3 1/2 years ago and have stuck with it and been pregnant twice since. It's also great if you're nursing your baby as the land aerobics can be a killer with the increased breast size! Few of my friends' families knew anything about water aerobics until I told them. It's a real fun way to exercise, and an unsung alternative or supplement to other exercise forms.
10. I think that water exercising is very beneficial to good health. I wish it was offered more than twice weekly at our facility.

## VI. Social Aspects

1. Water exercising helps my health and I've met friends my age. This has helped mentally as I've come from a different educational background.
2. I've made some good friends and recommend it to everyone I know.
3. Do enjoy the companionship, the instructor, the results.
4. As a senior citizen, I have found water exercise to be very beneficial. I have been in the program two years and enjoy the workout program and the fellowship of men and women with whom I have become acquainted. (60 Yrs. and Up).
5. Aquacise. It's great to get out, meet people, and do something that you benefit from physically.

## VII. Other

1. A booklet should be made available to help people exercise on their own. Include exercises for different body parts.
2. Water exercise helps me tremendously in training for my main sport, marathon cycling. I have noticed a big difference this off-season in my lung capacity, cardiovascular system and overall strength. I am an aqua-aerobics instructor and my students have commented similarly.
3. I would be very interested in information about the development of water aerobics (history, etc).
4. I hope to learn to swim. One woman (84 yrs.) learned here. If she can do it, I can.
5. When I started watercises, I didn't know how to swim. The fun I had helped me overcome fear of water and I took swimming lessons and now swim laps on a regular basis. My doctor recommends watercises for women who have had complete hysterectomies as a preventive measure.
6. Rubber bands should be used for upper body strength only. I would like to know if comments I have heard about working in cold water actually cause your body to add fat cells for insulation. Also would like information on prevention of leg cramps.
7. To whom it may concern: I started taking these classes with a "Y" membership. It was offered to us at work through a corporate membership. I really enjoy these classes and feel much better.
8. I am a registered nurse (retired). This hospital offers reduced rates to all retired employees. We can use any or all equipment or sports offered in our "Wellness Center." Supervised activities and sports at all times. I think they are open until 4 a.m.

# APPENDIX I

## The Researchers

### JOANNA MIDTLYNG, PRINCIPAL RESEARCHER

**Professional Preparation.** Indiana University, IN, P.E.D.; University of Washington, Seattle, M.S.; University of Montana, Missoula, B.S.; and study at the University of Oregon, Eugene; University of Illinois, Champaign; University of Colorado, Boulder; Springfield College (Springfield, MA); George Williams College (Chicago, IL); and the University of California at Berkeley. Fields of study: physical education; educational psychology; sociology.

**Professional Experience.** *Ball State University,* Muncie, IN: Professor of Physical Education; former Director, Undergraduate Professional Program for Women; Associate Director of Aquatics; and Advisor, Synchronized Swimming Club. *Indiana University,* Bloomington: Associate Instructor and doctoral candidate. *Illinois State University,* Normal.

Assistant Professor of Physical Education; Coordinator of Aquatics for Women; Advisor, Synchronized Swimming Club. *University of Washington,* Seattle: Graduate Teaching Assistant; master's degree candidate; Advisor, Synchronized Swimming Club. *Deer Lodge Public Schools,* Deer Lodge, MT: Supervisor of Physical Education; Coach, Competitive Swimming. *Custer County High School and Junior College,* Miles City, MT: physical educator.

**Current Aquatic Commitments, 1988-89.** Aquatic Council, The American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD): Chair, Advisory Committee to the Executive Board. Research in process: Phase II - National Survey of Water Exercise Teachers/Programs. Aquatic exercise research presentations: National Convention, AAHPERD, Boston, MA, *April 1989;* National Conference, National Council for Cooperation in Aquatics, Orlando, FL, *November 1988;* State Convention, IAHPERD, Muncie, and Inter-Agency Research Council, Muncie, *October 1988.*

**Past Professional Involvements Highlighted.** Chair-elect, Chair and Past-chair, Aquatic Council of AAHPERD; Chair-elect and Chair, Aquatic Section, the Midwest District Assoc. for Health, Physical Education, Recreation and Dance; and Chair-elect and Chair, Aquatic Section, IAHPERD and Montana Assoc. for Health, Physical Education and Recreation (MAHPER).

She has served as President, MAHPER; chair-elect and chair, Dance Section, Northwest District and Montana professional associations; aquatic consultant, Aquatic Council and the Division of Girls and Women's Sports of AAHPERD; editor of selected professional publications; research investigator of aquatic teaching strategies, and stress responses of women in advanced hunt horsemanship; author of 'Swimiming', Saunders College Publishing Co., Philadelphia, 1974 and 2nd revision of 1982, and other aquatic articles; member, Planning Committees for four National Conferences of the Aquatic Council, and Conference Director, National Aquatic Symposium of the Aquatic Council in Atlantic City, NJ. Dr. Midtlyng is a charter member of the Aquatic Council and life member of AAHPERD.

**Community Service:** member/secretary, Executive Board, Muncie Area Chapter, (MAC), of the American Red Cross (ARC); and Instructor Trainer, Water Safety Instructor, ARC . She has been recognized for academic achievement by membership in Phi Epsilon Chi and Phi Lambda Theta; and honored by MAC for " Outstanding Volunteerism and Dedication to the American Red Cross," for her work to raise funds through Swim-A-Cross for the chapter. Dr. Midtlyng is a recipient of the Dolphin Award by the University of Oregon, Eugene; the Honor Award, the Service Award, and the Outstanding Service Award by the Aquatic Council of AAHPERD, for contributions to the field of aquatics. A complete vita is available upon request.

## C. VAN CLEAVE NELSON, RESEARCHER

**Professional Preparation.** Indiana University, Bloomington, Ed. D.; Southern Illinois University, (Carbondale), M. S.; Earlham College, (Richmond, IN), A. B. Post doctoral study: Indiana University, Indianapolis; Ball State University (Muncie, IN)

**Professional Experience.** *Ball State University (BSU),* Muncie, IN: Research Design Consultant; Associate Professor, Computer Sciences and Mathematical Sciences; and Evaluation Consultant. *Indiana University,* Bloomington: Doctoral Fellow. *Southern Illinois University,* Carbondale: Graduate Assistant.

**Current Professional Commitments, 1988-89.** Special lecture/colloquia presentation : "Computer Analysis of Musical Sound", Department of Computer Science, BSU."

Aquatic exercise research presentations: National Convention, American Alliance for Health, Physical Education, Recreation and Dance, Boston, Ma., *April 1989;* National Conference, Council for National Cooperation in Aquatics, Orlando, FL, *November 1988.*

**Past Professional Involvements Highlighted.** Author and co-author of numerous professional publications in specialized areas as: mathematics, microcomputers and mainframes. Papers presented for professional bodies: the Academic Microcomputer Conference Annual Meeting; the ACM Computer Science Conference; Midwest Educational Research Association. Review Panelist for Division D, American Education Research Association; and manuscript reviewer for Brooks/Cole Publishing Co., Saunders Publishing Co., Kendall/Hunt Publishing Co., Schmidt Publishing Co. Recipient, Creative Teaching Grant, with C. P. Fuelling, "Development of Computer Assisted Learning and Teaching Modules for Calculus I", BSU.

**University Service.** At BSU, Dr. Nelson is a Research Design Consultant for faculty; and Creative Projects, Independent Studies and Honors Theses, for undergraduate and graduate students. Member, doctoral committees for graduate students from diverse backgrounds, as; Bioenergetics; Biology; Elementary Education; Music; Special Education. He has served as: Member, University Research Committee; and the Ad Hoc Committee for Academic Computing Reorganization.

**Professional Memberships.** American Education Research Association; Midwest Education Research Association; National Council for Measurement in Education; EDCUS. A complete vita is available upon request.